

Analysis of customer satisfaction of regional drinking water company Tirta Mulia Karimun the Riau Islands

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Abstract

Purpose: This study aims to analyze the direct and indirect effects of product quality, volume, tariff, and service on customer satisfaction at PDAM Tirta Mulia Karimun, Riau Islands Province.

Research Methodology: This study used a quantitative approach. The sample consisted of 200 respondents, who were analyzed using the SMARTPLS program. After validity and reliability tests were conducted, a hypothesis test was performed.

Results: The findings show that product quality, volume, and service have a significant direct effect on customer satisfaction, while tariffs do not have a direct significant effect. However, product quality, volume, and tariffs each significantly affected satisfaction indirectly through service quality ($p < 0.05$). The overall model explained 70.4% of the variance in customer satisfaction.

Conclusions: Customer satisfaction with PDAM Tirta Mulia Karimun is significantly influenced by product quality, volume, and services. Although tariffs do not directly influence satisfaction, they have a significant indirect effect on service. Improvements in water quality and volume are the most critical areas for increasing customer satisfaction.

Limitations: This study was limited to customers of PDAM Tirta Mulia Karimun in one regency, which may affect the generalizability of the results to other regions or service providers.

Contribution: This study provides empirical evidence of how indirect effects through service quality mediate customer perceptions, which can guide policy and operational improvements in regional water service companies.

Keywords: *Satisfaction, Services, Volume*

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1. Introduction

Water is a basic human need managed by the Regional Government through appointed regional companies (Masnun, Noviyanti, Santoso, Wedhatami, & Abiyoga, 2024). Water management in Karimun Regency, Riau Islands Province, is conducted by the regional drinking water company (PDAM) Tirta Mulia Karimun. One of the regional companies that is part of the Regional-Owned Enterprise (BUMD) and manages water resources in each region is PDAM, which is a company managed by the regional government that acts as a public service agency in its operations. The Regional Public Company (PERUMDA) Tirta Mulia Karimun is a regionally owned enterprise of Karimun Regency that was established in 1997. The management and finances of the PDAM are still under the control of Perusda Karimun. The purpose of establishing Perumda is to establish, build, organize, manage, and serve the provision of drinking water; distribute drinking water to customers; establish, build, and manage drinking water installations; and build, organize, and manage facilities that support the implementation of Perumda's business activities.

Customer satisfaction is one of the general requirements that must be met by a company to be successful in the competitive business world. By creating and maintaining customers, companies must be able to satisfy their customers wants and needs and capture existing opportunities through their marketing strategies (Zairina, Wibisono, Ngalliman, Indrayani, & Satriawan, 2023). Customer satisfaction, as a benchmark for companies on how things have been set in the future or even some things that have been determined, must be changed because customers feel dissatisfied or disadvantaged by the company's service (Mittal et al., 2023). If customers feel dissatisfied, they will complain to the company and may also complain about their dissatisfaction with other customers. Therefore, several factors influence customer satisfaction, including product quality, cost emotions, price, and service quality (Priyono & Yusran, 2022).

Product quality is a factor that affects customer satisfaction. In general, products can be offered to the market to attract attention, acquisition, and use/consumption to satisfy a desire or need (Afriyani, Indrayani, Indrawan, Wibisono, & Ngalliman, 2023). Therefore, the production of quality products can achieve an effective and efficient product because the product to be produced is in accordance with customer needs and expectations. To determine drinking water rates, the authority of the regional head, PDAM, uses the Cost Recovery principle. This principle implies that a company must be able to finance all its expenses without using financing sources outside the company. As an extension of the local government's provision of public services, PDAM is required not to burden the community (Mauliyah, 2016). Therefore, the determination of water prices set by the PDAM must not burden customers but also be able to finance the company's operational costs.

Based on initial observations made by researchers, there are several problems faced by customers regarding quality that cause customer dissatisfaction. The PDAM is considered unsatisfactory and has received many complaints from the public. Complaints from residents regarding poor service, such as water use operations, are still limited to 10 h per day. Furthermore, after 14 h, the community could not use water. The volume of water is very limited from morning to evening, and when it rains, the water changes color and appears unsterile and unhygienic. Another problem is related to the quality of the water, which is still cloudy and has an unpleasant odor. This study aims to analyze the direct influence of quality, volume, and tariffs on customer satisfaction of PDAM Tirta Mulia Karimun. This study is useful for determining various policies related to improving services so that they can meet customer expectations and the sustainability of PDAM Tirta Mulia Karimun.

2. Literature Review

2.1. Hypothesis Development

2.1.1. Water Quality on Customer Satisfaction

According to Cabral, Djaha, and Nursalam (2019), customer satisfaction is a feeling of pleasure or disappointment that arises after comparing the performance (or results) of a product that is thought to be in contrast to the expected performance. Arimie (2019) explains that customer satisfaction is a customer's response to the difference between the initial expectations and the actual performance of the product as perceived after consumption. Likewise, the results of research conducted by Morande and Marzullo (2019) show that product quality has a positive and significant effect on customer satisfaction in Metro City. The same results were also shown by research conducted by Acharya (2019), who found that product quality influences customer satisfaction in IndiHome.

H1: There is a direct relationship between product quality and customer satisfaction at PDAM Tirta Mulia Karimun.

2.1.2. Water Volume/Quantity on Customer Satisfaction

The quantitative requirements for the provision of clean water were reviewed based on the amount of raw water available, which could be used to meet the needs of the number of residents served (Kalensun, Kawet, & Halim, 2016). The provision of clean water must meet the needs of the community; by examining the clean water discharge, the quantity of clean water used can be determined (Lestari & Sriyono, 2021; M. F. Putra, Ahadiyat, & Keumalahayati, 2023). According to Setiyaningsih and Suwitri (2012), the quantity of clean water services can be determined from the level of community

consumption, where many people still use alternative water sources, such as drilled water and wells, to meet their daily needs.

The quantity of water can be assessed based on the amount obtained each month. In general, the volume and quantity of water are the amounts of clean water required to meet daily needs. Factors that influence the volume/quantity of water include technical factors, namely the use of water meters, and socio-economic factors, namely the population and the level of economic capacity of the community. If the quantity of water or the amount of water distributed to customers is met, and according to customer expectations, it will directly increase the customer satisfaction.

H2: There is a direct influence of water volume on customer satisfaction at PDAM Tirta Mulia Karimun.

2.1.3. Water Tariffs Against Customer Satisfaction

Pricing strategy is significant in providing value to consumers and influencing product image, as well as consumer decisions to purchase. Price is also related to income and influences supply or marketing channels (Carmona, Griffith, & Aguirre, 2021). However, the most important factor is that pricing decisions must be consistent with the marketing strategy. Price is the value that consumers exchange for a number of benefits by having or using a product or service (Eggert, Ulaga, Frow, & Payne, 2018). Every company marketing its goods or services to be successfully marketed must first determine the right price so that buyers are interested in buying goods or services. In the buying and selling process, price is one of the most important factors because it is a means of exchange in transactions. Price is the only element of the marketing mix that is flexible in nature and can change at any time. Price is also a factor in product marketing competition.

Price is an important factor that influences customer satisfaction. Price is defined as the sum of all values issued by customers to pay for a product or service that is owned or used by them. The price variable affects customer satisfaction at PDAM Tirta Jeneberang, Gowa Regency. The pricing set by PDAM Tirta Jeneberang, Gowa Regency, is good, where the prices imposed are in accordance with the customer's ability with the volume of water used; the better the price imposed, the more satisfied the customer will feel. H3: There is a direct relationship between water rates and customer satisfaction at PDAM Tirta Mulia Karimun.

2.1.4. PDAM Service Towards Customer Satisfaction

Service is an activity carried out by a person or group of people based on material factors through a system of procedures and with certain methods to fulfill the interests of others according to their rights (Angliawati, 2016). Research conducted by Burhan (2023) showed that the quality of service of the PDAM Sumber Pocong Bangkalan Regency significantly influences customer satisfaction. The same results were also shown by research conducted by Dayanti, Prabawati, and Supriyanti (2023), who found that service quality affects customer satisfaction at the Tirta Sewakadarma Regional Drinking Water Company (PDAM) of Denpasar City.

H4: There is a direct relationship between service and customer satisfaction at PDAM Tirta Mulia Karimun.

2.1.5. Water Quality for PDAM Services

According to Chandra, Wijaya, Angelia, and Hayati (2020), product quality is the value of a product that can satisfy consumers both physically and psychologically and refers to the attributes or properties contained in an item or result. Product quality is the ability of a product to perform its functions, including durability, reliability, accuracy, ease of operation, and repair, among other valuable attributes. Quality reflects all dimensions of product offerings that benefit the customers. Based on this description, product quality is the value of a product that can satisfy consumers both physically and psychologically, which refers to the attributes or properties contained in an item or result (Endi, Fanggidae, & Ndoen, 2023).

Product quality is one of the important factors for companies to increase sales volume; good product quality will make consumers loyal to a product, and providing good service quality will provide its own satisfaction for consumers (Fasiha, Yusuf, Sihombing, Mujahidin, & Chenini, 2022; Taufik, Santoso,

Fahmi, Restuanto, & Yamin, 2022). Satisfaction provides many benefits for the company, including repeat purchases and recommendations of the product or service to friends and acquaintances.

H5: There is a direct relationship between product quality and PDAM Tirta Mulia Karimun service.

2.1.6. Volume/Quantity of Water for PDAM Services

The volume/quantity of water, including rainfall, topography, and rock type, is generally influenced by the physical environment of an area. Water needs are the amount of water required for basic human needs (domestic) and other activities that require water (Utami, Geerling, Salami, Notodarmojo, & Ragas, 2024). Water needs determine the size of the system and are based on water usage. The availability of water distributed to customers is also expected to improve the quality of the PDAM services.

H6: There is a direct relationship between the water volume and PDAM Tirta Mulia Karimun services.

2.1.7. Water Tariffs for PDAM Services

According to Wyckof, as quoted by Tjiptono, public service quality is defined as follows: Service quality is the level of excellence expected and control over the level of excellence to meet customer desires. If the service or service received or felt (perceived service) is in accordance with expectations, the quality of service or service is perceived as good and satisfying (Zulfahmi, Fatimah, & Gunawan, 2018).

H7: There is a direct relationship between water rates and PDAM Tirta Mulia Karimun services.

2.1.8. Water Quality Towards Customer Satisfaction Through PDAM Services

Customers who are satisfied with a product or service are often caused by the fact that they feel that the service provided by the company is not only in accordance with their needs, but also satisfying and in accordance with their expectations (Siagian, 2020). The expectations referred to in this case are in terms of the quality of water obtained by consumers, such as being odorless, non-cloudy, and dirty.

H8: There is an indirect influence between product quality and customer satisfaction at Tirta Mulia Karimun.

2.1.9. Water Volume/Quantity on Customer Satisfaction Through PDAM Services

Customer satisfaction is influenced by several factors, including the services provided. The service is said to be poor if the availability of water distributed to customers is still far from sufficient for daily life. The debit or volume of flowing water should have been regulated and checked by PDAM, so that PDAM is indirectly said to have tried to improve services to achieve customer satisfaction (Djaing, Sangkala, & Yani, 2020).

H9: Water volume has an indirect effect on customer satisfaction at PDAM Tirta Mulia Karimun.

2.1.10. Water Tariffs on Customer Satisfaction Through PDAM Services

Customer satisfaction has become a central concept in business and management. Customers are the main focus of discussions on satisfaction and service quality (Rahu, Neolaka, & Djaha, 2023; Rusmadi, 2020). Therefore, customers play an important role in measuring satisfaction with the products and services provided by the company.

H10: Water rates indirectly affect customer satisfaction at PDAM Tirta Mulia Karimun.

3. Research Methodology

This study was conducted in Karimun Regency, Riau Islands, Brazil. The study will be conducted over a four-month period, from April 2024 to July 2024. A quantitative approach was used to address the problems raised in this study. Quantitative research emphasizes testing theories by measuring variables numerically and analyzing data using statistical procedures. Data in the form of numbers were processed and analyzed to obtain scientific information behind the numbers. The population in this study was all customers of PDAM Tirta Mulia Karimun, totaling 9,424 House Connections (SR). The sample measurement technique used in this study was sampling from the Slovin formula. After the calculations, 200 samples were used to represent the population.

The data sources in this study were the subjects from whom the data were obtained. The data in this study were quantitative in the form of numbers (Schutt, 2019). The data sources used in this study are primary and secondary data sources, namely, data obtained directly from PDAM Tirta Mulia Karimun customers through the distribution of questionnaires. Primary data were collected directly by researchers from the source, such as by providing questionnaires or question lists to customers of PDAM Tirta Mulia Karimun. The researchers collected secondary data from all existing sources. These data usually come from other research conducted by institutions or organizations, including official documents, books, and research results in the form of reports.

4. Result and Discussion

Before conducting the hypothesis test, a validity test was conducted on the data collected from the PDAM Tirta Mulia Karimun customer questionnaire. The results showed that the indicator items against their constructs were greater than the cross loading value. Thus, it can be concluded that all constructs or latent variables have good discriminant validity. After testing validity, the next test is the reliability test, which is measured by the Composite Reliability and Average Variance Extracted (AVE) values. A construct is declared reliable if the composite reliability value is > 0.60 and the AVE value is > 0.50 . After testing validity, the next test is the reliability test, which is measured by the Composite Reliability and Average Variance Extracted (AVE) values. A construct is declared reliable if the composite reliability value is > 0.60 and the AVE value is > 0.50 . Based on these calculations, all constructs met the reliability criteria. This is indicated by the Composite Reliability value above 0.60 and AVE above 0.50. After ensuring that the data were valid and reliable, a hypothesis test was performed. The results are presented in the following table:

Table 1. Results of Direct Influence Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Product Quality (X1) → Customer satisfaction (Y)	0,411	0,414	0,071	5,761	0,000
Volume (X2) → Customer satisfaction (Y)	0,206	0,211	0,074	2,792	0,005
Rates (X3) → Customer satisfaction (Y)	-0,100	-0,105	0,071	1,413	0,158
Product Quality (X1) → Service (Z)	0,376	0,368	0,083	4,542	0,000
Volume (X2) → Service (Z)	0,324	0,326	0,083	3,881	0,000
Rates (X3) → Service (Z)	0,211	0,220	0,068	3,098	0,002
Service (Z) → Customer satisfaction (Y)	0,376	0,371	0,070	5,405	0,000

Source: Primary data processed with PLS (2024)

Table 2. Results of Indirect Effect Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Product Quality (X1) → Service (Z) → Customer satisfaction (Y)	0,141	0,137	0,042	3,390	0,001
Volume (X2) → Service (Z) → Customer satisfaction (Y)	0,122	0,120	0,036	3,353	0,001
Rates (X3) → Service (Z) → Customer satisfaction (Y)	0,079	0,082	0,030	2,653	0,008

Source: Primary data processed with PLS, 2024

4.1. Influence of Product Quality on Customer Satisfaction

The results of the data processing show that the first hypothesis is accepted with a t-statistic value of $5.761 > 1.972$ and a p-value of $0.000 < 0.05$. This proves that product quality has a significant direct influence on customer satisfaction of the PDAM Tirta Mulia Karimun, where the better the product offered, the higher the level of customer satisfaction. Product quality is the primary factor influencing customer satisfaction. Product Quality is the ability of a product to perform its functions, including durability, reliability, accuracy, ease of operation and repair, and other valuable attributes. If PDAM Tirta Mulia Karimun provides product quality, in this case good water quality, and in accordance with customer expectations, customers will be satisfied; however, if the quality of the product provided does not match customer expectations, customers will be dissatisfied. The results of this study are in line with research conducted by Pahlawan, Laba, Pakki, Hardiyono, and Nurlia (2019) entitled *The Influence of Product Quality and Service Quality on Increasing Customer Satisfaction and Loyalty of the Makassar City Regional Drinking Water Company (PDAM)*, which shows that product quality has a positive and significant effect on customer satisfaction. Several other studies with similar results have also been conducted (Damanik, Sitorus, & Mertajaya, 2021; Falahuddin, Fuadi, Munandar, Juanda, & Ilham, 2022).

4.2. The Influence of Volume on Customer Satisfaction

The results of the data processing show that the second hypothesis is accepted with a t-statistic value of $2.792 > 1.972$ and a p-value of $0.005 < 0.05$. This proves that volume has a significant direct effect on customer satisfaction; the more sufficient and adequate the volume of water distributed, the higher the level of customer satisfaction. An adequate water volume is important for customer satisfaction (CS). Customers expect sufficient water to meet their daily needs, such as bathing, washing, cooking, and sanitation. In addition to quantity, the continuous availability of water also has an effect. Customers will be more satisfied if the water flows all day without interruption than if water supplies are often interrupted or only available at certain hours. Sufficient water volume is also related to good water pressure. Low water pressure can reduce customer satisfaction, even if the total volume is adequate. In short, the provision of sufficient, stable, and even quantities of water is a key factor in maintaining and increasing customer satisfaction. The results of this study are consistent with those of Erlianti et al. (2023) and Santoso ((Santoso, 2022), who discussed the continuity and volume of water and their influence on customer satisfaction.

4.3. The Influence of Tariffs on Customer Satisfaction

The results of the data processing show that the third hypothesis is rejected with a t-statistic value of $1.413 < 1.972$ and a p-value of $0.158 > 0.05$. This proves that tariffs have a direct but insignificant effect on customer satisfaction at PDAM Tirta Mulia Karimun, where an increase or decrease in the tariff imposed does not significantly affect the level of customer satisfaction. Water is a basic need, and customers may feel they have no alternatives; therefore, the tariff is not a major factor in determining satisfaction, and they consider that the availability of water is more important than its price. If the PDAM provides high-quality and consistent clean water, customers will not mind the tariff because the quality and reliability of the service are more important than the tariff for customers. At PDAM Tirta Mulia Karimun, customers only pay Rp36,000/cubic, equivalent to the use of five 200-liter water drums, compared to the cost of purchasing clean water per drum, which can reach Rp8,000, with the usage of up to two drums per day. The results of this study differ from those of previous studies by Damanik et al. (2021); Falahuddin et al. (2022), who concluded that price affects customer satisfaction.

4.4. The Influence of Service on Customer Satisfaction

The results of the data processing show that the fourth hypothesis is accepted with a t-statistic value of $5.405 > 1.972$ and a p-value of $0.000 < 0.05$. This proves that service has a significant direct influence on customer satisfaction at PDAM Tirta Mulia Karimun, where the better the service provided, the higher the customer satisfaction. Service is an effort to meet customer needs by providing the best possible quality of service. With good service quality, customers obtain goods and services that meet their needs. Good service quality is also important. Every time a business process is carried out, both goods and services must be provided because service quality is closely related to the purchasing decisions. If the service received and felt is in accordance with expectations, the quality of the service

is considered good and in accordance with what customers want. Service in this case includes responses to complaints, such as the speed of handling and solving problems, ease of access to services, such as easy payment processes, and system reliability, such as good infrastructure maintenance. The results of this study support those of Ayunani, Varadina, and Octavia (2023), who concluded that service quality variables significantly affect customer satisfaction.

4.5. The Influence of Product Quality on Service

The results of data processing show that the fifth hypothesis is accepted, with a t-statistic value of $4.542 > 1.972$ and a p-value of $0.000 < 0.05$. This proves that product quality has a significant direct influence on the service of PDAM Tirta Mulia Karimun; the better the quality of water provided to customers, the better the service of PDAM Tirta Mulia Karimun. In the context of PDAM, the main "product" is water distributed to customers. The quality of this product significantly influences the overall service of the PDAM. Good quality water contributes to the public health. This reduces the potential for health problems that can affect PDAM services. Meeting water quality standards helps PDAM comply with regulations and focus on improving services rather than dealing with legal issues. With guaranteed water quality, PDAM can allocate resources for innovation in other aspects of service. The most complicated aspect of a service is its quality, which is greatly influenced by customer expectation. Service quality is a dynamic condition related to products, services, people, processes, and the environment in which quality assessment is determined at the time the public service is provided. Good water quality reduces complaints and repairs, thereby increasing customers' perception of the services provided.

4.6. The Influence of Volume on Service

The results of data processing show that the sixth hypothesis is accepted, with a t-statistic value of $3.881 > 1.972$ and a p-value of $0.000 < 0.05$. This proves that the water volume has a significant direct influence on the service of PDAM Tirta Mulia Karimun, where the more consistent the volume of water distributed, the better the service of PDAM Tirta Mulia Karimun. Adequate water volume allows the PDAM to provide 24/7 water services, expand service coverage to more areas, and increase customer confidence in the PDAM services. Therefore, there were no complaints related to water shortages or water flow. Water volume also indicates a sufficient water quantity that can allow the PDAM to handle peak demand, such as in the morning and evening. The results of this study are in line with the opinion of Gleick (1996), who stated that adequate water quantity is the basis for meeting basic human needs, which then affects the quality of water utility services. Various theories and expert opinions have emphasized that water quantity has a significant and multidimensional influence on PDAM services. Adequate water quantity not only affects the PDAM's ability to meet customers' basic needs but also plays an important role in aspects such as security, sustainability, fairness, and service efficiency.

4.7. The Influence of Tariffs on Services

The results of the data processing show that the seventh hypothesis is accepted with a t-statistic value of $3.098 > 1.972$, and a p-value of $0.002 < 0.05$. This proves that water tariffs have a significant direct influence on PDAM Tirta Mulia Karimun services, where the better and more reasonable the tariffs set, the better the PDAM Tirta Mulia Karimun service is. An appropriate tariff can support the expansion of the distribution network and increase public access to clean water, which has the potential to improve service quality by reaching more customers. With sufficient funding from tariffs, the PDAM can increase the capacity of its customer service team. Thus, they can accelerate their responses to complaints and improvements. The results of this study support the theory proposed by Rogers, De Silva, and Bhatia (2002), which emphasizes the importance of tariffs in covering the full cost of water services. Tariffs have a complex influence on PDAM services. Determining the right tariff ensures the financial sustainability of PDAM and affects various operational and strategic aspects in determining the overall quality of PDAM services.

4.8. The Influence of Product Quality on Customer Satisfaction Through Service

The results of data processing show that the eighth hypothesis is accepted, with a t-statistic value of $3.390 > 1.972$ and a p-value of $0.001 < 0.05$. This proves that product quality significantly influences customer satisfaction through PDAM Tirta Mulia Karimun services, where the better the quality of the

product or water (clear, odorless, and safe) that is distributed, the better the service provided to meet expectations and increase customer satisfaction. Good product quality not only satisfies basic customer needs but also improves the perception of overall service quality. This occurs through various mechanisms, including increasing operational efficiency, building trust, and enhancing customer-perceived value. The results of this study support the research conducted by Merdekawati and Sulistyawati (2011) on PDAM in Bali, which showed that product quality has a positive effect on customer satisfaction through service quality. The results of the same study by Y. Putra (2020) on PDAM in Surabaya found that product quality directly and indirectly affects customer satisfaction through service quality.

4.9. The Influence of Volume on Customer Satisfaction Through Service

The results of data processing show that the ninth hypothesis is accepted, with a t-statistic value of $3.353 > 1.972$ and a p-value of $0.001 < 0.05$. This proves that water volume has a significant effect on customer satisfaction through PDAM Tirta Mulia Karimun services, where the more consistent the quantity and pressure of water provided, the better the service provided to meet expectations and increase customer satisfaction. The amount of water distributed to customers is an important factor in meeting daily needs. The greater the volume of water that can be distributed, the better the PDAM service, and the provision of sufficient water can increase customer satisfaction. The volume of water affects customer satisfaction, but this influence occurs through the intermediary of PDAM's service quality. The better the PDAM can provide sufficient water, the higher the quality of its service, which ultimately increases customer satisfaction.

The results of this study are in line with the research by the Indonesian Ministry of Public Works and Public Housing in 2016, who found that the continuity of water flow has a significant effect on PDAM customer satisfaction, where sufficient water volume is an important indicator of service continuity (Permatasari, Hardjosoekarto, & Salomo, 2020). Research by Rindo, Rusmiwari, and Larasati (2017) on PDAM Malang City also revealed that water quantity has a positive effect on customer satisfaction with PDAM services acting as an intervening variable. Likewise, research by Pranata, Fari, Suryani, and Handayani (2023) at the PDAM Tirta Dharma Klaten Regency showed that service quality, including water availability, has a positive effect on customer satisfaction with the mediating role of service.

4.10. The Influence of Tariffs on Customer Satisfaction Through Service

The results of the data processing show that the tenth hypothesis is accepted with a t-statistic value of $2.653 > 1.972$ and a p-value of $0.008 < 0.05$. This proves that water rates have a significant effect on customer satisfaction through the PDAM Tirta Mulia Karimun services, where the high and low rates imposed can affect the services provided, thereby indirectly affecting customer satisfaction. Higher rates tend to increase customer expectations of PDAM service quality; therefore, PDAM must adjust the quality of service according to the rates set. Adequate rates tend to encourage PDAM to improve infrastructure and service quality to increase customer satisfaction. Customers will certainly compare the rates paid to the quality of services received. If a service meets or exceeds expectations based on the rate, customer satisfaction tends to increase. The results of this study support previous research conducted by Alfin and Rusindiyanto (2024) in PDAM Surabaya City, which found that rates have a significant effect on customer satisfaction with service quality, acting as a mediator.

5. Conclusion

The results of this study indicate that quality and volume have significant direct and indirect effects on customer satisfaction at PDAM Tirta Mulia Karimun. However, tariffs had no significant effect on customer satisfaction. However, tariffs significantly affect satisfaction with services. It is expected that PDAM Tirta Mulia Karimun can maintain the quality of the water produced, further improve the quality of its service, and create a pricing policy that can improve the company's financial performance, which can ultimately increase investment in service improvements in the future.

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