
THE INFLUENCE OF BRAND IMAGE AND BRAND TRUST ON THE DECISION TO PURCHASE LE MINERALE BRAND BOTTLED WATER IN THE JABODETABEK REGION



Shani Suryaningsih^{1*}
Universitas Paramadina, Jakarta, Indonesia
shanisrh25@gmail.com

Agung Surya Dwianto²
Universitas Paramadina, Jakarta, Indonesia
agung.dwianto@paramadina.ac.id

Abstract

The competition in the Bottled Drinking Water (AMDK) industry in Indonesia, particularly in the Jabodetabek region, has shifted from price wars to a focus on reputation and product value. This phenomenon is highlighted by the significant rise in Le Minerale's market share, which challenges the dominance of established market leaders. This study aims to analyze the influence of Brand Image and Brand Trust on consumer Purchase Decisions for Le Minerale products. This research employed a quantitative approach, collecting data from 120 respondents in the Jabodetabek region selected through purposive sampling. The data were analyzed using Multiple Linear Regression with SPSS version 26 software. The results indicate that both Brand Image and Brand Trust, whether tested partially or simultaneously, have a positive and significant influence on consumer purchase decisions. The coefficient of determination reveals that these two variables contribute 58.2% to the purchase decision, while the remaining percentage is influenced by other factors outside this study. These findings suggest that building a modern product image and maintaining strong consumer trust are key strategies for winning competition in the bottled water market.

Keywords: Brand Image, Brand Trust, Purchase Decision, Le Minerale, Bottled Drinking Water (AMDK).

INTRODUCTION

The escalating growth of the Fast-Moving Consumer Goods (FMCG) industry in Indonesia, particularly the Bottled Drinking Water (AMDK) subsector, reflects a transformation in urban lifestyles that are increasingly oriented toward health and practicality (Rahayu & Ahmadi, 2025). In strategic economic hubs such as Jabodetabek (Jakarta, Bogor, Depok, Tangerang & Bekasi), competition among AMDK brands has shifted from mere price wars to a rivalry based on reputation and product value (Alvian & Putra, 2025). Modern consumers tend to conduct critical evaluations before finalizing purchase decisions, demanding high-quality standards from products intended for daily consumption (Maribert et al., 2025). Consequently, many consumers have begun to abandon established brands and switch to new brands perceived as having superior quality (Fitrie & Valentino, 2025). This is evidenced by Top Brand Index data (2021–2025), which demonstrates a drastic surge in Le Minerale's market share from 4.60% to 23.20%, whereas the market leader experienced a significant decline from 62.50% to 47.40% (TBI Data, 2025). Therefore, understanding the underlying reasons for this shift in consumer preferences is crucial for business sustainability within the AMDK sector (Elvina et al., 2025).

Table 1.
Top Brand Index for Bottled Water (2021-2025)

Name Product	2021	2022	2023	2024	2025
AQUA	62.50%	57.20%	55.10%	46.90%	47.40%
Le Minerale	4.60%	12.50%	14.50%	18.80%	23.20%
Club	5.80%	3.80%	3.50%	3.30%	3.70%
Cleo	3.70%	4.20%	4.20%	5.10%	5.20%
Ades	7.50%	6.40%	5.30%	5.50%	3.90%

Source: Top Brand Award (2025)

The data in the table above reveals that the primary determinant driving consumer purchase decisions is the strength of brand image (Sari et al., 2025). Le Minerale has successfully established a perception of novelty through its single-use gallon innovation, which is associated with high hygiene standards and a distinctive taste (Mashlihah & Hapsari, 2025). This positive image serves as a signal of quality that persuades consumers to choose the product over competitors (Wangsadipa et al., 2025). In addition to image, the brand trust variable plays a vital role as a risk mitigation mechanism (S. Lestari, 2024). Amid concerns regarding product counterfeiting, consumers decide to purchase brands that provide guarantees of physical security (intact seals) and consistent quality (Imanda et al., 2025).

This trust acts as a catalyst enabling consumers to overcome doubts and concretely finalize their purchase decisions. Although Le Minerale demonstrates a positive growth trend, the sustainability of consumer purchase decisions continues to face challenges from competitors' defensive strategies, which include price wars and the diversification of similar products (Parulian & Nilasari, 2025). From a strategic perspective, brand image functions as the initial attraction, while brand trust serves as the validation that solidifies the purchase

transaction (Natasiah & Syaefulloh, 2024). Previous research asserts that the integration of a positive image and strong trust constitutes the most accurate predictor for determining purchase decisions in a highly competitive market (Reynaldi & Nuvriasari, 2024). Based on this urgency, this study aims to comprehensively analyze the simultaneous influence of brand image and brand trust on purchase decisions for Le Minerale in the Jabodetabek region (Hidayatullah et al., 2025).

Furthermore, within a competitive market ecosystem, the interaction between brand image and brand trust creates a crucial synergy in influencing urban consumer behavior (Hidayah et al., 2025). Consumers who perceive a product as having a modern image while also trusting its safety guarantees will possess a significantly stronger psychological drive to make a purchase decision compared to those driven by a single factor alone (Aini & Rosyidah, 2025). This phenomenon underscores that to win the highly critical Jabodetabek market, it is insufficient for companies to merely build visual popularity (image), they must be capable of converting it into solid confidence (trust) (Natasiah & Syaefulloh, 2024). Based on this dynamic business phenomenon and empirical urgency, this study is designed to examine and analyze in depth the simultaneous influence of Brand Image and Brand Trust on Purchase Decisions for Le Minerale in the Jabodetabek region (Hifzillah & Arief, 2025).

Moreover, there is an academic urgency to revalidate the consistency of prior research findings, given that urban consumer behavior in Jabodetabek tends to evolve rapidly in response to health-related trends (Natasiah & Syaefulloh, 2024). The majority of previous studies were conducted within different regional contexts or product categories; thus, generalizing these findings to Le Minerale consumers in Jabodetabek requires fresh empirical validation (S. Lestari, 2024). This study is expected not only to bridge existing gaps in the literature but also to provide concrete managerial implications for marketing strategies within the drinking water industry (Prasetyo et al., 2024).

Brand image is defined as the holistic perception ingrained in the minds of consumers that differentiates one product from another (Lelyana et al., 2025). In a competitive market, a positive brand image serves as a navigational tool that facilitates consumers in selecting quality products. Consumers tend to exhibit higher confidence in products with an established image, thereby expediting the decision-making process (M. Lestari & Wismantoro, 2024). Specifically in the case of Le Minerale, its image as "fresh" and "hygienic" drinking water serves as a primary driver of consumer preference. Empirical studies demonstrate that brand image contributes significantly to increasing the probability of consumer purchase decisions directly (Nadirah et al., 2025).

H1: *Brand Image positively and significantly influences the Purchase Decision of Le Minerale in the Jabodetabek region.*

Brand trust is the consumer expectation that a brand can be relied upon and is capable of fulfilling its promises without failure (Sunaryanto & Noviyanti, 2025). This variable is crucial for consumable products (such as drinking water) as it serves to mitigate perceived risk and consumer uncertainty. When consumers place full confidence in the safety integrity of Le Minerale, psychological barriers to purchase are eliminated (M. Lestari & Wismantoro, 2024). Recent research asserts that brand trust is a dominant variable capable of convincing consumers to finalize their purchase transactions (Yunita & Suardana, 2025).

H2: *Brand Trust positively and significantly influences the Purchase Decision of Le Minerale in the Jabodetabek region.*

Theoretically, Brand Image and Brand Trust share a mutually reinforcing symbiotic relationship (Nadirah et al., 2025). Brand image functions as an external appeal that generates interest, whereas brand trust acts as an internal bond that provides a sense of security. The synergy between a "compelling appearance" and a "strong sense of trust" creates a purchasing impetus that is significantly greater than if these variables were to operate in isolation. Statistical evidence from various recent studies confirms that, simultaneously, these two variables exert a positive and significant influence on consumer purchase decisions (Lelyana et al., 2025; Yunita & Suardana, 2025).

H3: *Brand Image and Brand Trust simultaneously positively and significantly influence the Purchase Decision of Le Minerale in the Jabodetabek region.*

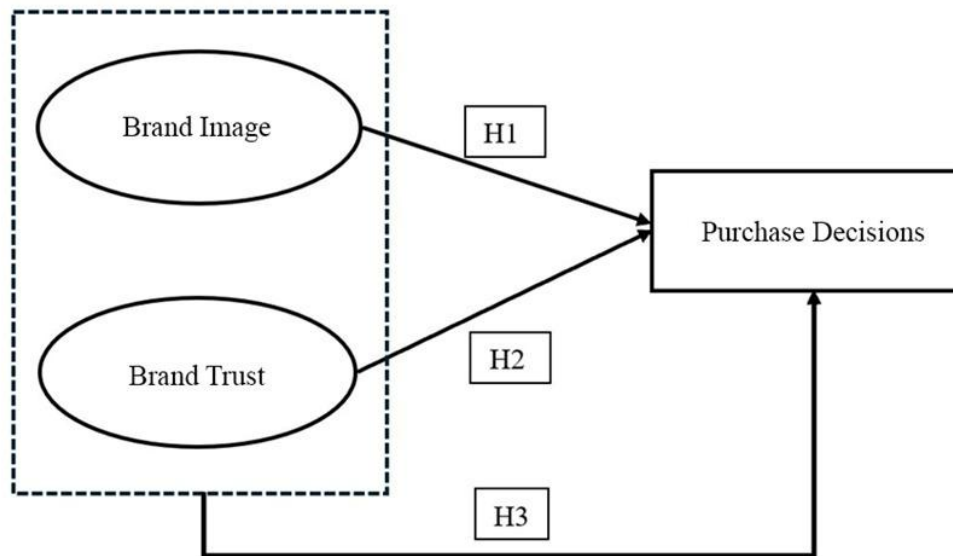


Figure 1.
Conceptual Framework

RESEARCH METHOD

This study employs a quantitative approach with descriptive and causal designs, selected for their ability to measure relationships between variables objectively, systematically, and based on empirical data. This approach enables the researcher to gain an in-depth understanding of the relationship between brand image and brand trust on consumer purchase decisions for Le Minerale bottled drinking water products. The descriptive design is utilized to portray the characteristics of the research variables factually, while the causal design is used to identify cause-and-effect relationships between the variables under study. The population in this study encompasses individuals categorized as consumers of bottled drinking water in the Jabodetabek region, specifically those who possess knowledge and experience in consuming the Le Minerale brand. The determination of the sample size utilizes Hair's formula approach due to the infinite (unknown) population size (Putri et al., 2025). The sample size was derived by multiplying 12 indicators by 10, resulting in a total of 120 respondents. Data collection was conducted using structured questionnaires with a five-point

Likert scale (1 = strongly disagree to 5 = strongly agree), distributed online via Google Forms. Respondent selection employed the Purposive Sampling technique, with criteria including: a minimum age of 17 years, possessing knowledge about the Le Minerale brand, having consumed the product, and residing in the Jabodetabek region.

The data analysis technique utilized in this study was conducted through several systematic stages, including validity tests, reliability tests, multiple linear regression analysis, and the coefficient of determination test. To analyze the statistical data and test the hypothesis model, the researcher utilized SPSS software version 26.

Table 2.
Measurement of Variables

Variable	Indicator	Reference
<i>Brand Image</i>	<p>BI1 = I perceive that Le Minerale's single-use gallon innovation reflects a modern and hygienic product.</p> <p>BI2 = Le Minerale possesses a distinctive refreshing taste compared to other drinking water brands.</p> <p>BI3 = The design of Le Minerale's bottle and logo conveys the impression of a clean and high-quality product.</p> <p>BI4 = Le Minerale is a drinking water brand that is very popular and widely known by the public.</p>	Mashlihah & Hapsari (2025); Lukman & Ratnanto (2025)
<i>Brand Trust</i>	<p>BT1 = I believe that Le Minerale's water quality is consistently clear and its purity is maintained.</p> <p>BT2 = I feel secure purchasing Le Minerale because its packaging seal is guaranteed to be safe and difficult to counterfeit.</p> <p>BT3 = I am confident that the information regarding mineral content on Le Minerale's packaging is true and honest.</p> <p>BT4 = I perceive Le Minerale as a brand that cares about the health assurance of its consumers.</p>	Maribert et al. (2025); Sunaryanto & Noviyanti (2025)
Purchase Decision	<p>PD1 = I feel that I have made the right decision in choosing to purchase Le Minerale.</p> <p>PD2 = Purchasing Le Minerale has become a routine habit for meeting my daily drinking needs.</p>	Putri et al. (2025); Maribert et al. (2025)

Variable	Indicator	Reference
	PD3 = Le Minerale is the primary choice I look for when I am at a store or minimarket.	
	PD4 = I do not hesitate to recommend Le Minerale to friends or relatives as a good drinking water.	

RESULTS AND DISCUSSION

Table 3.
Validity Test Results

Variable	Instrument	r-calculated	r-table	Note
X1 Brand Image	X1.1	0.761	0.1793	Valid
	X1.2	0.810		Valid
	X1.3	0.785		Valid
	X1.4	0.673		Valid
X2 Brand Trust	X2.1	0.778		Valid
	X2.2	0.781		Valid
	X2.3	0.854		Valid
	X2.4	0.851		Valid
Y1 Purchase Decision	Y1.1	0.827		Valid
	Y1.2	0.896		Valid
	Y1.3	0.862		Valid
	Y1.4	0.793		Valid

Source: Data Processing Spss 26

Table 4.
Reliability Test Results

Variabel	Koefisien Cronbach-Alpha	Note
X1 Brand Image	0.751	Reliable
X2 Brand Trust	0.832	Reliable
Y1 Purchase Decision	0.865	Reliable

Source: Data Processing Spss 26

Based on the validity test results in the table above, every research instrument has a calculated r-value that is higher than the r-table value. Therefore, it can be concluded that all the instruments used are valid. Furthermore, the reliability test results from 120 respondents show that the Cronbach's Alpha score is greater than 0.6. This indicates that all the research instruments have a good level of reliability and can be trusted for data collection.

Table 5.
Partial Test Results (t-test)

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
(Constant)	-1.609	1.315			-1.223	0.224
Brand Image	0.590	0.100	0.455		5.920	0.000
Brand Trust	0.467	0.092	0.390		5.085	0.000

a. Dependent Variable: Purchase Decision

Source: Data Processing SPSS 26

Based on the *t-test* results in the table above, the Brand Image variable has a t_{count} of 5.920 with a significance level of 0.000 (< 0.05), indicating that Brand Image has a significant influence on Purchase Decision. Furthermore, the Brand Trust variable obtained a t_{count} of 5.085 with a significance level of 0.000 (< 0.05), which means that Brand Trust also significantly affects Purchase Decision. Since the regression coefficients for both variables are positive (0.590 and 0.467), it can be concluded that higher brand image and brand trust lead to higher consumer purchase decisions.

Table 6.
Simultaneous Test Results (f-test)

Model	Sum of Squares		Mean Square	F	Sig.
	Squares	df			
Regression	668.574	2	334.287	81.331	0.000 ^b
Residual	480.893	117	4.110		
Total	1149.467	119			

a. Dependent Variable : Purchase Decision

b. Predictors (Constant), Brand Trust, Brand Image

Source: Data Processing Spss 26

Based on the *F* test results in the table above, the calculated F-value (F_{count}) is 81.331 with a significance level of 0.000. Since the significance value is substantially lower than 0.05 ($0.000 < 0.05$), it can be concluded that Brand Image and Brand Trust simultaneously have a positive and significant effect on Purchase Decision. These results demonstrate that the proposed regression model is feasible (goodness of fit) and suitable for predicting the factors influencing consumer purchase decisions.

Table 7.
Coefficient of Determination Test Results

Model	R	R Square	Adjusted R	Std Error of
			Square	The Estimate
1	0.763 ^a	0.582	0.574	2.027

-
- a. Predictors (Constant), Brand Trust, Brand Image
 - b. Dependent Variable: Purchase Decision
-

Source: Data Processing SPSS 26

Discussions

The results of this study indicate that Brand Image has a positive and significant influence on the purchase decision for Le Minerale in the Jabodetabek region, confirming the acceptance of the first hypothesis. This finding is consistent with research conducted by (Lelyana et al., 2025), which demonstrates that a strong and innovative brand image serves as a primary differentiator in a saturated market. In the Jabodetabek area, consumers tend to possess higher health literacy; thus, the "fresh" and "hygienic" image established through single-use gallon innovations has become a compelling value proposition. This image is not merely a visual element but a quality assurance that facilitates the consumer's decision-making process (Wangsadipa et al., 2025).

The results of the second hypothesis testing reveal that Brand Trust also exerts a positive and significant influence on the purchase decision for Le Minerale. This is supported by the findings of Maribert et al., (2025), where consumers who place a high level of trust in packaging integrity and mineral content information tend to feel more secure. Trust functions as a vital risk mitigation mechanism, particularly in urban areas prone to product counterfeiting issues (Imanda et al., 2025). In this study, respondents exhibited strong confidence that Le Minerale consistently maintains its water purity, which serves as the final validation factor in the transaction process.

The third hypothesis demonstrates that both Brand Image and Brand Trust simultaneously and significantly influence purchase decisions for Le Minerale. This finding reflects a complementary synergy where brand image serves as the initial attraction and brand trust acts as the bond that solidifies the decision (Maribert et al., 2025). When a product successfully projects a modern image while providing a sense of security, the purchasing impetus becomes substantially stronger (Aini & Rosyidah, 2025). The integration of these two aspects is a key strategy for Le Minerale in disrupting the dominance of market leaders within the highly competitive bottled water ecosystem (Hifzillah & Arief, 2025)

CONCLUSION

Based on the analysis, testing, and discussion, this study concludes that all proposed hypotheses are accepted. Empirical findings prove that Brand Image has a positive and significant influence on purchase decisions for Le Minerale in the Jabodetabek region. This indicates that a more positive consumer perception of product innovation and visual quality leads to a higher propensity for purchase. Similarly, Brand Trust is proven to have a positive and significant effect, reaffirming that a sense of security and product reliability are the fundamental pillars for maintaining consumer loyalty in urban markets.

This research provides important contributions for stakeholders in the bottled water industry, particularly in designing marketing strategies based on reputation reinforcement and product safety guarantees. A limitation of this study is its geographic scope, which is restricted to Jabodetabek with a sample size of 120 respondents; thus, the generalization of results may vary in regions with different demographic characteristics. Future research is

expected to expand the geographic coverage and incorporate other mediating or moderating variables, such as environmental awareness regarding plastic packaging or brand loyalty, to obtain a more comprehensive understanding of the dynamics of consumer behavior in the future bottled water market.

REFERENCES

- Aini, A. N., & Rosyidah, N. (2025). Pengaruh Halal Labeling, Brand Image, Price, dan Product Quality terhadap Repurchase Interest Air Minum Le Minerale (Studi pada Konsumen di Sidoarjo). *Jurnal Tana Mana*, 6(3), 118–129.
- Alvian, A., & Putra, H. B. (2025). Media Sosial, Citra Merek dan Kualitas Produk: Kunci Loyalitas Konsumen Air Mineral Dalam Kemasan di Era Digital. *JIMEA | Jurnal Ilmiah MEA (Manajemen, Ekonomi, Dan Akuntansi)*, 9(3), 2952–2968.
- Elvina, S. N., Reflis, Khairani, L., & Bungati. (2025). Pengaruh Citra Merek, Kualitas Produk Dan Kepercayaan Merek Terhadap Keputusan Pembelian Konsumen MSG X Di Kota Bengkulu. *Jimea: Jurnal Ilmiah MEA (Manajemen, Ekonomi Dan Akuntansi)*, 9(2), 206–218.
- Fitrie, F. N., & Valentino, O. (2025). Pengaruh Gaya Hidup dan Citra Merek Terhadap Keputusan Pembelian Sayuran Hidroponik di Palembang. *Publishing: Jurnal Akuntansi Manajemen, Dan Perencanaan Kebijakan*, 2(3), 1–14.
- Hidayah, E., Salsabila, T. Z., Widiyastuti, I., & Susanti, R. N. (2025). Preferensi Mahasiswa terhadap Varian Merk pada Air Minum dalam Kemasan. *Almufi Jurnal Sosial Dan Humaniora*, 2(3), 364–373.
- Hidayatullah, M. S., Supardi, & Febriansah, R. E. (2025). Analisis Dampak Citra Merek, Kualitas Produk dan Inovasi Produk terhadap Keputusan Pembelian Produk Indomie. *PARADOKS Jurnal Ilmu Komunikasi*, 8(3), 956–970.
- Hifzillah, M. H., & Arief, M. (2025). Pengaruh Brand Awareness, Brand Image, Dan Brand Trust Terhadap Minat Beli Konsumen Mahato Coffeeshop di Jakarta Barat. *Jurnal Ilmiah Wahana Pendidikan*, 11(8), 131–139.
- Imanda, R. W. T., Sari, L. R., & Ammaridho, E. A. (2025). Pengaruh Faktor Psikologis, Citra Merek Dan Kepercayaan Terhadap Keputusan Pembelian Produk Tepung Bumbu Sajiku. *Jurnal EBA*, 12(2), 1–15.
- Isbahi, M. B., Zuana, M. M. M., & Toha, M. (2024). The Multi-Social Relation of the Cattle Industry in the Plaosan Subdistrict Animal Market of Magetan Regency. *Malacca: Journal of Management and Business Development*, 1(1), 31–46. <https://doi.org/10.69965/malacca.v1i1.51>
- Lelyana, A. A., Saroh, S., & Anastuti, K. U. (2025). Pengaruh Brand Image, Brand Trust dan Digital Marketing Terhadap Keputusan Pembelian Konsumen pada Produk Skintific. *JLIGABI*, 14(2), 669–679.
- Lestari, M., & Wismantoro, Y. (2024). Pengaruh Brand Image, Harga, Brand Trust Dan Kualitas Produk Terhadap Keputusan Pembelian Lipstik Wardah Di Kota Semarang. *Jurnal Maneksi*, 13(1), 233–241.
- Lestari, S. (2024). Pengaruh Brand Image dan Brand Trust Terhadap Keputusan Pembelian di Perusahaan Inslide Solution. *Journal of Economics, Business, Management, Accounting and Social Sciences (JEBMASS)*, 2(3), 156–162.

- Maribert, S., Handayani, E. N., Quintania, M., & Nova, F. (2025). Pengaruh Kepercayaan Merek dan Citra Merek terhadap Keputusan Pembelian Air Minum dalam Kemasan Le Minerale (Studi Kasus Pada Masyarakat Jakarta Timur). *Excellent: Jurnal Manajemen, Bisnis Dan Pendidikan*, 12(1), 94–108.
- Mashlihah, Y. H., & Hapsari, M. T. B. (2025). The Influence of Brand Image on Purchasing Decision of Le Minerale Bottled Water among Adolescents in Surakarta : A Psychological Perspective. *Golden Ratio of Marketing and Applied Psychology of Business*, 5(2), 495–508.
- Nadirah, S., Ruwaida, Trisnawati, N., & Endang. (2025). Pengaruh Brand Trust, Brand Image dan Brand Experience Terhadap Keputusan Pembelian Cat Tembok Merek Mowilex di Toko Kemenangan Jaya Jakarta Pusat. *Jurnal IKRAITH-EKONOMIKA*, 8(3), 601–609.
- Natasiah, U., & Syaefulloh. (2024). Brand Image , Brand Trust , and Brand Ambassador on Purchase Decisions of Shopee E-Commerce Users in Pekanbaru City. *JMB:Jurnal Manajemen Bisnis*, 11(1), 120–134.
- Parulian, Y. J. E., & Nilasari, I. (2025). Pengaruh Citra Merek, Fitur Produk dan Persepsi Harga Terhadap Minat Beli Produk Air Minum Dalam Kemasan Merek Club di Kota Bandung. *JIMEA: Jurnal Ilmiah MEA (Manajemen, Ekonomi Dan Akuntansi)*, 9(3), 578–593.
- Prasetyo, D., Firdaus, F., Jumai, J., & Nurhayati, N. (2024). The Impact of Brand Trust and Brand Image on Purchase Decision Through Buying Interest Consumers as an Intervening Variable. *Economics and Business International Conference Proceeding*, 1(2), 815–829.
- Putri, A. A., Herlina, L., & Kusumawardani, A. (2025). Pengaruh Kualitas Produk, Brand Image Dan Brand Ambassador Terhadap Keputusan Pembelian Kosmetik Madame Gie Pada Mahasiswa Di Kota Bandung. *Journal of Information System, Applied, Management, Accounting and Research*, 9(2), 474–487. <https://doi.org/10.52362/jisamar.v9i2.1772>
- Rahayu, D. P., & Ahmadi, M. A. (2025). Pengaruh Kepercayaan Merek, Gaya Hidup dan Citra Merek Terhadap Minat Beli Konsumen. *PENG Jurnal Ekonomi Dan Manajemen*, 2(1), 1129–1136.
- Reynaldi, & Nuvriasari, A. (2024). The Influence of Brand Image and Perceived Value on Purchasing Decisions with Brand Trust as Mediation. *Research Horizon*, 4(3), 179–188.
- Sari, N. M. W., Atmaja, N. P. C. D., & Manek, D. (2025). Pengaruh Citra Merek, Electronic Word of Mouth (E-WOM) dan Persepsi Harga Terhadap Keputusan Pembelian Konsumen Pada Produk Sushi Rasa Lokal. *Jurnal Emas*, 6(7), 1552–1564.
- Sunaryanto, K., & Noviyanti, T. L. (2025). Pengaruh Brand Image terhadap Purchase Intention Dimediasi Oleh Brand Trust pada American Fastfood Dimasa Fenomena Boikot. *MAMEN Jurnal Manejemen*, 4(4), 845–860. <https://doi.org/10.55123/mamen.v4i4.6423>
- Wangsadipa, H. B. L. B., Hadi, S. P., & Nurseto, S. (2025). Pengaruh Citra Merek Dan Kepercayaan Merek Terhadap Keputusan Pembelian Susu Bear Brand Dengan Minat Beli Sebagai Variabel Intervening Pada Konsumen Generasi Z Di Kota Semarang. *Jurnal Ilmu Administrasi Bisnis*, 14(3), 1140–1150.

Yunita, N. K. N., & Suardana, I. B. R. (2025). Pengaruh Brand Image, Brand Trust dan Electronic Word of Mouth Terhadap Keputusan Pembelian Produk di Fore Cofee Gatsu Tengah. *Economic Reviews Journal*, 4(4), 2473–2491. <https://doi.org/10.56709/mrj.v4i4.998>