Open Access



Asian Journal of Environmental Research
E-ISSN: 3047-4930
DOI: https://doi.org/10.69930/ajer.v3i3.1023
Research Article

ScienceTech. Group

Vol. 3 (3), 2026
Page: 366-382

Analysis of the Determinants of Intention to Use Digital Wallets: Integrating Perceived Ease of Use, Trust, Risk, and Security Factors

Satryawati Satryawati, Tandi Kadang *, Hamdani Hamdani, Yonal Pasang Ambalinggi, Omar Dhanny, Salsabila Rahma Putri, Evan Mahardika Suferwandi

Department of Business Administration, State Polytechnic of Samarinda, Indonesia
*Email (corresponding author): tandikadang@gmail.com

Abstract. *The rapid growth of cashless payments in Indonesia has intensified competition among digital wallet providers, making it important to understand what shapes users' intention to use these services. Drawing on an extended Technology Acceptance Model, this study examines the associations of perceived ease of use, trust, perceived risk, and security with the intention to use the DANA digital wallet in Samarinda City, Indonesia. An explanatory cross-sectional online survey was conducted in 2024 among 100 DANA users recruited through purposive sampling. Measurement quality was assessed using item–total correlations, construct-level principal component analysis, and Cronbach's alpha, and the hypotheses were tested using multiple linear regression after checking multicollinearity, heteroscedasticity, linearity, and residual normality. Perceived ease of use ($\beta = 0.409$; $p = 0.001$) and security ($\beta = 0.246$; $p = 0.022$) were positively and significantly associated with intention to use, with perceived ease of use being the strongest predictor, whereas trust and perceived risk were not significant. Together, the four predictors explained 61.2% of the variance in intention to use (adjusted $R^2 = 0.595$). Because heteroscedasticity was detected, heteroscedasticity-consistent standard errors were also estimated: the association with ease of use remained robust, whereas that with security became marginal (HC3 $p = 0.061$). The findings suggest that practical usability, and to a lesser extent visible transaction security, matter more to DANA users than general trust and risk perceptions, a pattern that should be confirmed with larger probability samples. The results inform interface design, anti-fraud safeguards, and consumer protection policies that support responsible digital transactions and sustainable digital financial inclusion in line with SDG 8 and SDG 9.*

Keywords: *Perceived Ease of use; Trust; Perceived Risk; Security; Intention to use*

1. Introduction

The rapid diffusion of digital technology has reshaped the way people consume, transact, and manage their finances. In Indonesia, the number of internet users reached 221.56 million in 2024, the year in which the data for this study were collected, and rose further to 229.43 million in 2025, equivalent to a penetration rate of 80.66% (1). This expanding connectivity has accelerated the shift toward cashless payments: Bank Indonesia recorded 15.51 billion QRIS transactions worth IDR 1,420.66 trillion throughout 2025, representing annual growth of 148.54% in volume and 115.27% in value (2). Digital wallets (e-wallets) lie at the center of this transformation because they enable users to store funds, transfer money, pay bills, and purchase goods through a mobile device without carrying

Received: 29 October 2026 / Accepted: 18 November 2026 / Available online: 19 November 2026

cash or cards, while offering additional value through promotions and integration with merchant ecosystems (3,4).

Among the e-wallet platforms operating in Indonesia, DANA has emerged as one of the most widely used. In 2024, when the present survey was conducted, the company reported approximately 180 million users and more than 30 million transactions per day (5). Its leading position has persisted since then: a national Jakpat survey conducted in November 2025 found that 72% of e-wallet users used DANA, ahead of GoPay (60%), ShopeePay (46%), and OVO (27%) (6). The same survey shows that many consumers use several e-wallets simultaneously, so the position of any single platform is never secure and depends on its ability to keep users willing to transact through it (6). At the same time, the growth of digital transactions has been accompanied by a sharp increase in financial fraud; the Indonesia Anti-Scam Center received 311,597 scam reports with total losses of IDR 7.3 trillion between November 2024 and October 2025 (7). The 2025–2026 figures cited in this section post-date the 2024 fieldwork; they are presented as contextual background on the trajectory of the market and of digital fraud, not as conditions that respondents experienced at the time of data collection. Under these conditions, the sustainability of an e-wallet depends not only on how easily the application can be operated but also on the extent to which users trust the provider, how they assess the risks involved, and how secure they feel when transacting (8,9).

The Technology Acceptance Model (TAM) remains one of the most widely used frameworks for explaining individual adoption of new technologies (10). It posits that perceived ease of use, namely the degree to which a person believes that using a system will be free of effort, shapes attitudes and behavioral intention toward that system (11). Because financial transactions involve uncertainty, recent e-wallet studies have extended TAM with trust, perceived risk, and perceived security (8,9,12). Trust reduces the uncertainty arising from information asymmetry between users and service providers and has long been integrated with TAM in online transaction settings (13); perceived risk reflects users' subjective expectation of possible financial, privacy, or performance losses (14); and perceived security refers to users' belief that their personal data and funds are protected by the technical safeguards of the platform. Together, these constructs capture both the functional and the psychological considerations that users weigh before deciding to use a digital payment service.

However, empirical evidence on these determinants remains inconsistent. Perceived ease of use has been found to significantly increase the intention to use e-wallets among Malaysian working adults, Filipino Generation Z and millennials, and Indonesian e-wallet users (3,12,15,16), whereas no significant effect was found among Generation Z users in Kuala Lumpur and Generation X users in Java (4,17). Trust significantly predicted the intention or continuance intention to use e-wallets in several studies (9,12,16–19), yet it did not affect continuance usage intention among e-wallet users in Malaysia (20). Perceived risk significantly reduced the continuance intention to use mobile payment services among Indonesian users (21), but its effect was not significant among Generation Z users in Colombia and among users of Indonesian mobile payment applications (9,22). Similarly, perceived security has been reported as a direct determinant of intention to use (19,23,24), whereas other studies indicate that its influence is transmitted mainly through trust rather than acting directly on usage behavior (8,25). These divergent results suggest that the role of each determinant is context-dependent and has not yet been settled. Moreover, most

previous studies were conducted in Java, Sumatra, or neighboring countries, while evidence from Kalimantan remains scarce. Samarinda, the capital of East Kalimantan Province, offers a relevant setting: non-cash transactions in the province reached IDR 13.78 trillion in 2024, with QRIS transactions growing by 240% compared with the previous year (26), and the city's proximity to the new national capital, Nusantara, positions it as an emerging center of digital economic activity.

Based on this context, this study aims to examine the partial and simultaneous associations of perceived ease of use, trust, perceived risk, and security with the intention to use the DANA digital wallet in Samarinda City. Consistent with the extended TAM and the studies reviewed above, five hypotheses were formulated: perceived ease of use (H1), trust (H2), perceived risk (H3), and security (H4) each have a significant partial relationship with intention to use, and the four factors jointly have a significant relationship with intention to use (H5). The study re-examines an extended TAM by testing the four determinants in a single model for users of a market-leading e-wallet, thereby clarifying which factors matter most in shaping usage intention, and it provides empirical evidence from a regional city outside Java that is rarely represented in financial technology adoption research.

Beyond its relevance to providers, understanding what drives the intention to use e-wallets is linked to broader development goals. Digital payment services are a key channel for financial inclusion, which supports Sustainable Development Goal (SDG) 8 on decent work and economic growth, particularly target 8.10 on expanding access to banking and financial services for all, and SDG 9 on industry, innovation, and infrastructure, including target 9.3 on access to financial services for small enterprises and target 9.c on access to information and communication technology (27,28). Global evidence shows that digital payments can serve as an entry point into the formal financial system for previously unbanked adults (29), yet their benefits are sustainable only when transactions are responsible and consumers are protected from fraud and data misuse (28). The findings are therefore expected to contribute to the literature on digital consumer behavior and to offer practical implications for e-wallet providers seeking to improve application usability and security, and for regulators seeking to strengthen consumer protection and sustainable digital financial inclusion in the regions.

2. Methods

2.1. Research Design and Sample

This study employed a quantitative approach with an explanatory, cross-sectional survey design, in which hypotheses derived from the extended TAM were tested by examining the relationships between the independent and dependent variables (30). The design was used to explain how perceived ease of use (X1), trust (X2), perceived risk (X3), and security (X4) are related to the intention to use (Y) the DANA digital wallet. Because all variables were measured through self-reports at a single point in time, the design supports conclusions about association and prediction but not about cause-and-effect relationships. Data were obtained through a survey method, in which a standardized questionnaire was administered to respondents who met predetermined criteria (31). The study was conducted in Samarinda City, East Kalimantan, between February and December 2024, and all questionnaire data were collected within this period.

The population comprised all DANA users residing in Samarinda City, whose exact number is unknown. Respondents were therefore recruited through purposive sampling

based on two criteria: (i) having used the DANA application to conduct transactions and (ii) residing in Samarinda City. Because the population size could not be determined, the minimum sample size was estimated using the Lemeshow formula for an unknown population (32), $n = Z^2\,p(1-p)/d^2$, where $Z = 1.96$ for a 95% confidence level, $p = 0.5$ is the maximum estimated proportion, and $d = 0.10$ is the tolerated sampling error. This yields $n = (1.96^2 \times 0.5 \times 0.5)/0.10^2 = 96.04$, which was rounded up to 97 respondents, and the target was set at 100. A sample of 100 also exceeds the minimum of 82 cases ($50 + 8m$, with $m = 4$ predictors) recommended for testing the overall fit of a multiple regression model (33). Because the Lemeshow formula assumes probability sampling, whereas a non-probability purposive sample was used, the calculation serves only as a benchmark for the minimum number of respondents; the results cannot be regarded as statistically representative of all DANA users in Samarinda (34).

2.2. Research Instruments

The research instrument was a closed questionnaire consisting of 18 statements that measured the five variables studied. Perceived ease of use was measured by four items (easy to learn, easy to understand, easy to find and use features, and controllable); trust by four items (protection of personal and financial information, capability in handling transactions, accuracy and honesty of information, and reliability of information); perceived risk by three items (concern about financial loss, expectation of financial loss, and perceived riskiness of transactions); security by three items (a reliable security system, protection of personal information, and transactions free from fraud); and intention to use by four items (intention to use frequently and continuously, intention to transact because of speed, perceived benefits, and use in daily activities). The indicators were adapted from previous e-wallet studies and adjusted to the context of the DANA application (35). All items were rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Instrument quality was evaluated in three steps. First, item validity was examined using the Pearson correlation between each item and its construct total, with a critical value of 0.1966 (n = 100, α = 0.05, two-tailed); corrected item–total correlations, which exclude the item from its own total, were also inspected. Second, because each set of items was designed to measure a single construct, unidimensionality was examined through a principal component analysis (PCA) performed separately for each construct, retaining components with eigenvalues greater than 1 and applying no rotation because a single component was expected. Sampling adequacy was assessed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity (36). This procedure is exploratory; confirmatory factor analysis was not performed, so the component loadings reported in this study should not be interpreted as confirmatory factor loadings. Third, internal consistency was assessed using Cronbach's alpha, with values of 0.60 or above considered acceptable for exploratory research (37), bearing in mind that alpha tends to be lower for scales with few items (38).

2.3. Data Collection and Screening

Primary data were collected through an online questionnaire created with Google Forms. The questionnaire link was distributed through personal messages on Instagram and WhatsApp to DANA users in Samarinda City, and participation was voluntary. The questionnaire consisted of two parts: the first recorded respondent characteristics (gender, age, highest level of education, occupation, monthly income, and district of residence), and the second contained the 18 statements measuring the research variables.

The analyzed sample consisted of 100 respondents who met both inclusion criteria. Eligibility was established from the questionnaire itself, in which respondents confirmed that they had used DANA to conduct transactions and reported their district of residence, selected from the ten districts of Samarinda City. Before analysis, all responses were checked for completeness, duplicate submissions (by comparing submission timestamps, demographic profiles, and response patterns across all items), and careless responding, such as identical answers to all 18 items (39); all 100 responses analyzed were complete and eligible.

2.4. Data Analysis

The data were analyzed using IBM SPSS Statistics version 27. Descriptive statistics were used to describe respondent characteristics and the distribution of answers; the mean score of each item was classified using an interval of 0.80 into five categories: very low (1.00–1.79), low (1.80–2.59), moderate (2.60–3.39), high (3.40–4.19), and very high (4.20–5.00). Construct scores were computed as the mean of their items. The relationships were estimated using multiple linear regression with the model $Y = \alpha + \beta_1X1 + \beta_2X2 + \beta_3X3 + \beta_4X4 + e$, where Y is intention to use, α is the constant, β_1–β_4 are the regression coefficients, X1–X4 are perceived ease of use, trust, perceived risk, and security, and e is the error term (40).

Because normality of the residuals alone does not establish that the assumptions of ordinary least squares regression are satisfied (41), four groups of diagnostics were examined. Multicollinearity was assessed using tolerance and the variance inflation factor (VIF), with tolerance above 0.10 and VIF below 10 indicating no serious multicollinearity, while VIF values above 3 were treated as a signal of overlap among predictors that may inflate standard errors (42). Heteroscedasticity was assessed using the Breusch–Pagan test in its studentized (Koenker) form, which does not require normally distributed errors (43,44), supplemented by the Glejser and White tests (40). Linearity and functional form were assessed using Ramsey's RESET test, computed by adding the squared and cubed fitted values to the model (45), and the deviation-from-linearity test for each predictor. Normality of the residuals was examined with the one-sample Kolmogorov–Smirnov test with the Lilliefors correction, and influential observations were screened using standardized residuals and Cook's distance. Because heteroscedasticity was detected (Section 3.3), heteroscedasticity-consistent (HC) standard errors were also estimated, with HC3 as the primary robust estimator for a sample of this size and HC1 for comparison (46); these were obtained through the GLM Univariate procedure.

Hypotheses were tested at a significance level of 0.05 using the t-test for the partial relationships and the F-test for the simultaneous relationship. The coefficient of determination (R Square, R^2) expresses the proportion of the variance in intention to use explained by the predictors in the sample, whereas the Adjusted R Square corrects R^2 for the number of predictors relative to the sample size and therefore provides a less optimistic estimate of explanatory power (40). In addition, 95% confidence intervals and squared semi-partial correlations (sr^2) were reported to indicate the precision and the unique contribution of each predictor.

2.5. Research Procedure

The research proceeded in six stages: (1) preparing the instrument by formulating statements from the indicators of each variable and adapting them to the DANA context; (2) distributing the online questionnaire; (3) checking the completeness and eligibility of the 100

responses; (4) evaluating the measurement quality of the instrument; (5) performing descriptive analysis, regression diagnostics, multiple linear regression, and hypothesis testing; and (6) interpreting the results, drawing conclusions, and formulating recommendations for practitioners and future research.

3. Results and Discussion

3.1. Respondent Profile

Table 1 presents the characteristics of the 100 respondents. Most respondents were female (56%), aged 20–25 years (55%), and held a bachelor's degree (47%) or a senior high school certificate (35%). Private-sector employees (35%) and students (26%) were the largest occupational groups, and more than half of the respondents (53%) reported a monthly income of IDR 1–3 million. Respondents lived in all ten districts of Samarinda, with the largest shares in Samarinda Seberang (20%), Samarinda Kota (16%), and Sungai Kunjang (13%). The sample is therefore dominated by young, educated adults, which should be considered when interpreting the findings.

Table 1. Respondent Characteristics (n = 100)

Characteristic	Category	n	%
Gender	Male	44	44
	Female	56	56
Age (years)	20–25	55	55
	25–30	37	37
	30–35	7	7
	35–40	1	1
Highest education	Senior high school or equivalent	35	35
	Diploma (D1–D3)	17	17
	Bachelor's degree (S1/D4)	47	47
	Postgraduate (S2/S3)	1	1
Occupation	Private-sector employee	35	35
	Student	26	26
	Civil servant	18	18
	Entrepreneur	18	18
	Other	3	3
Monthly income	< IDR 1 million	27	27
	IDR 1–3 million	53	53
	> IDR 5 million	20	20
District of residence	Samarinda Seberang	20	20
	Samarinda Kota	16	16
	Sungai Kunjang	13	13
	Sambutan	12	12
	Palaran	11	11
	Loa Janan Ilir	9	9
	Sungai Pinang	8	8
	Samarinda Utara	6	6
	Samarinda Ilir	4	4
	Samarinda Ulu	1	1

Note: Age bands and income categories are reported as worded in the questionnaire. No respondent selected the ≤ 19 or ≥ 41 years, junior high school, housewife, or armed forces/police categories, and the questionnaire did not include an IDR 3–5 million income category. Source: Data processed by the authors.

3.2. Descriptive Statistics and Measurement Quality

As shown in Table 2, all item means fell within the high category (3.40–4.19), ranging from 3.57 (X2.1) to 4.14 (Y.3), and the construct means ranged from 3.76 for perceived risk to 4.01 for intention to use. All Pearson item–total correlations (0.671–0.852) exceeded the critical value of 0.1966, and the corrected item–total correlations ranged from 0.313 to 0.642. For every construct, the PCA extracted a single component with an eigenvalue greater than 1, explaining 55.7%–60.3% of the item variance, and all component loadings were at least 0.643. The KMO values were acceptable for perceived ease of use (0.751), trust (0.690), intention to use (0.680), and security (0.609), but marginally below the conventional minimum of 0.50 for perceived risk (0.499), although Bartlett's test was significant for all constructs ($p < 0.001$). Cronbach's alpha ranged from 0.600 to 0.779, meeting the 0.60 threshold for exploratory research; however, the perceived risk (0.600) and security (0.655) scales were only marginally reliable.

Table 2. Item Statistics, Component Loadings, and Reliability of the Constructs

Construct / item	Mean	SD	r item–total	Corrected r	Loading
Perceived ease of use (X1): M = 3.90; a = 0.779; KMO = 0.751; eigenvalue = 2.41 (60.3%)					
X1.1 Easy to learn	3.77	1.10	0.808	0.626	0.808
X1.2 Easy to understand	3.96	0.97	0.715	0.514	0.718
X1.3 Easy to find and use features	3.95	1.05	0.810	0.642	0.818
X1.4 Controllable	3.92	1.11	0.769	0.560	0.758
Trust (X2): M = 3.83; a = 0.730; KMO = 0.690; eigenvalue = 2.23 (55.7%)					
X2.1 Protection of personal and financial information	3.57	1.09	0.693	0.425	0.650
X2.2 Capability in handling transactions	3.81	0.87	0.679	0.475	0.698
X2.3 Accuracy and honesty of information	3.91	1.08	0.800	0.599	0.816
X2.4 Reliability of information	4.03	1.09	0.801	0.600	0.808
Perceived risk (X3): M = 3.76; a = 0.600; KMO = 0.499; eigenvalue = 1.68 (55.9%)					
X3.1 Concern about financial loss	3.64	1.05	0.703	0.344	0.697
X3.2 Expectation of financial loss	3.67	1.11	0.852	0.592	0.876
X3.3 Perceived riskiness of transactions	3.98	1.02	0.675	0.313	0.652
Security (X4): M = 4.00; a = 0.655; KMO = 0.609; eigenvalue = 1.78 (59.4%)					
X4.1 Reliable platform security system	3.92	0.92	0.803	0.537	0.827
X4.2 Protection of personal information	4.07	1.02	0.824	0.531	0.828
X4.3 Transactions free from fraud	4.02	0.88	0.676	0.346	0.643
Intention to use (Y): M = 4.01; a = 0.740; KMO = 0.680; eigenvalue = 2.25 (56.3%)					
Y.1 Use frequently and continuously	3.80	1.01	0.794	0.593	0.804
Y.2 Transact because of speed	4.06	0.89	0.717	0.509	0.735
Y.3 Significant benefits	4.14	0.90	0.671	0.438	0.653
Y.4 Use in daily activities	4.03	1.08	0.809	0.598	0.798

Note: r item–total = Pearson correlation between the item and its construct total (critical r = 0.1966; n = 100; a = 0.05, two-tailed); corrected r = correlation with the total excluding the item; loading = component loading from a principal component analysis run separately for each construct (one component extracted, eigenvalue > 1, no rotation); the percentage after each eigenvalue is the share of item variance explained by the component. Bartlett's test of sphericity was significant for every construct (p < 0.001). Source: Data processed by the authors.

Within each construct, the items with the highest component loadings indicate which aspects respondents most strongly associate with the construct. For perceived ease of use, ease of finding and using features (X1.3; 0.818) loaded highest, suggesting that the ease of locating and operating DANA's many features is central to users' perception of ease. For trust, the accuracy and honesty of information (X2.3; 0.816) and the reliability of information (X2.4; 0.808) loaded almost equally, indicating that trust rests mainly on the dependability of the information and services provided by the application. For perceived risk, the expectation of financial loss (X3.2; 0.876) was dominant, suggesting that risk perception is driven mainly by concerns about losing money. For security, the reliable platform security system (X4.1; 0.827) and the protection of personal information (X4.2; 0.828) loaded virtually identically, indicating that users' assessment of security is closely tied to the protection mechanisms implemented by the provider. For intention to use, the intention to use DANA frequently and continuously (Y.1; 0.804) loaded highest. Because these loadings come from an exploratory, construct-by-construct PCA, they describe the internal structure of each scale rather than confirm a measurement model.

3.3. Regression Diagnostics

Table 3 summarizes the diagnostics of the regression model. Tolerance values (0.279–0.528) were above 0.10 and VIF values (1.893–3.579) were well below 10, indicating no serious multicollinearity. Nevertheless, the VIF values of perceived ease of use (3.579) and trust (3.552), together with their bivariate correlation of 0.801, show that these two predictors share considerable variance, which enlarges their standard errors and makes their unique contributions harder to separate (42). The studentized Breusch–Pagan test (LM = 12.258; p = 0.016) and the Glejser test (F = 3.620; p = 0.009) indicated heteroscedasticity, although no single predictor was individually significant in the Glejser regression, and the White test did not detect it (p = 0.164). The RESET test showed no evidence of functional-form misspecification (p = 0.270), and the deviation-from-linearity tests were non-significant for perceived ease of use, perceived risk, and security but significant for trust (p = 0.015). The Kolmogorov–Smirnov test (D = 0.084; p = 0.079) indicated that the residuals did not depart significantly from normality. No observation was influential (maximum Cook's distance = 0.223), although one respondent had a standardized residual of 3.42 and was retained. Because heteroscedasticity can bias conventional standard errors, the coefficients in Table 4 are reported with both conventional and HC3 significance values (46).

Table 3. Regression Diagnostics

Assumption / test	Statistic	p	Conclusion
Multicollinearity			
Perceived ease of use (X1)	Tol. = 0.279; VIF = 3.579	–	Acceptable
Trust (X2)	Tol. = 0.282; VIF = 3.552	–	Acceptable
Perceived risk (X3)	Tol. = 0.528; VIF = 1.893	–	Acceptable
Security (X4)	Tol. = 0.366; VIF = 2.735	–	Acceptable
Heteroscedasticity			
Breusch–Pagan (Koenker, studentized)	LM = 12.258; df = 4	0.016	Heteroscedastic
Glejser	F(4, 95) = 3.620	0.009	Heteroscedastic
White	LM = 19.020; df = 14	0.164	Not detected
Linearity and functional form			
Ramsey RESET ($\hat{y}^2$, $\hat{y}^3$)	F(2, 93) = 1.329	0.270	Adequate
Linearity deviation: X1	F(12, 86) = 1.192	0.302	Linear
Linearity deviation: X2	F(11, 87) = 2.312	0.015	Departure
Linearity deviation: X3	F(9, 89) = 1.290	0.253	Linear
Linearity deviation: X4	F(8, 90) = 1.433	0.194	Linear
Residual normality and influential cases			
Kolmogorov–Smirnov (Lilliefors)	D = 0.084	0.079	Normal
Cook's distance (maximum)	0.223	–	No influential case
Standardized residual (maximum |z|)	3.42 (one case)	–	One outlier retained

Note: Tol. = tolerance; VIF = variance inflation factor; LM = Lagrange multiplier statistic; RESET = regression specification error test with the squared and cubed fitted values added to the model. Source: Data processed by the authors.

3.4. Hypothesis Testing

Table 4 reports the results of the multiple linear regression. With a critical t-value of 1.985 (df = 95, α = 0.05), perceived ease of use (X1) was positively and significantly associated with intention to use (B = 0.362; β = 0.409; t = 3.380; p = 0.001), and its standardized coefficient was the largest among the predictors. This association remained significant with HC3 robust standard errors (p = 0.006). Security (X4) was also positively and significantly associated with intention to use under conventional standard errors (B = 0.248; β = 0.246; t = 2.331; p = 0.022); however, this result was sensitive to the correction for heteroscedasticity, remaining significant with HC1 standard errors (p = 0.047) but becoming marginal with HC3 standard errors (p = 0.061). Trust (X2) had a positive but non-significant coefficient (β = 0.114; t = 0.943; p = 0.348), as did perceived risk (X3) (β = 0.099; t = 1.128; p = 0.262); both 95% confidence intervals included zero, and neither conclusion changed with robust standard errors. In terms of unique explained variance, perceived ease of use accounted for 4.7% (sr^2 = 0.047; f^2 = 0.12) and security for 2.2% (sr^2 = 0.022; f^2 = 0.06), whereas trust and perceived risk each accounted for less than 1%.

Table 4. Multiple Linear Regression Results (Dependent Variable: Intention to Use)

Predictor	B	SE	β	t	p	95% CI for B	p (HC3)
(Constant)	0.851	0.280	–	3.033	0.003	[0.294, 1.408]	0.028
Perceived ease of use (X1)	0.362	0.107	0.409	3.380	0.001	[0.149, 0.574]	0.006
Trust (X2)	0.107	0.113	0.114	0.943	0.348	[−0.118, 0.332]	0.444
Perceived risk (X3)	0.091	0.081	0.099	1.128	0.262	[−0.069, 0.251]	0.392
Security (X4)	0.248	0.106	0.246	2.331	0.022	[0.037, 0.459]	0.061

Note: B = unstandardized coefficient; SE = conventional standard error; β = standardized coefficient; CI = confidence interval; p (HC3) = p-value based on HC3 heteroscedasticity-consistent standard errors (HC1 p-values: X1 = 0.003, X2 = 0.406, X3 = 0.355, X4 = 0.047). Critical t(95) = 1.985. Source: Data processed by the authors.

As shown in Table 5, the F-test produced F(4, 95) = 37.426 with $p < 0.001$, exceeding the critical value of 2.467, which indicates that the four predictors jointly explain a significant proportion of the variance in intention to use. Table 6 shows an R Square of 0.612, meaning that 61.2% of the variance in intention to use in this sample is explained by the four predictors, while the remaining 38.8% is attributable to factors outside the model. The Adjusted R Square, which corrects for the number of predictors relative to the sample size, is 0.595, providing a less optimistic estimate that approximately 59.5% of the variance would be explained in the population; the standard error of the estimate is 0.462. Figure 1 summarizes the estimated model.

Table 5. Simultaneous Test (F-test)

Model	Sum of squares	df	Mean square	F	p
Regression	32.000	4	8.000	37.426	< 0.001
Residual	20.307	95	0.214		
Total	52.307	99			

Note: Predictors: (constant), X1, X2, X3, X4; dependent variable: intention to use (Y). Critical F(4, 95) = 2.467. Source: Data processed by the authors.

Table 6. Coefficient of Determination

Model	R	R Square	Adjusted R Square	Std. error of the estimate
1	0.782	0.612	0.595	0.462

Source: Data processed by the authors.

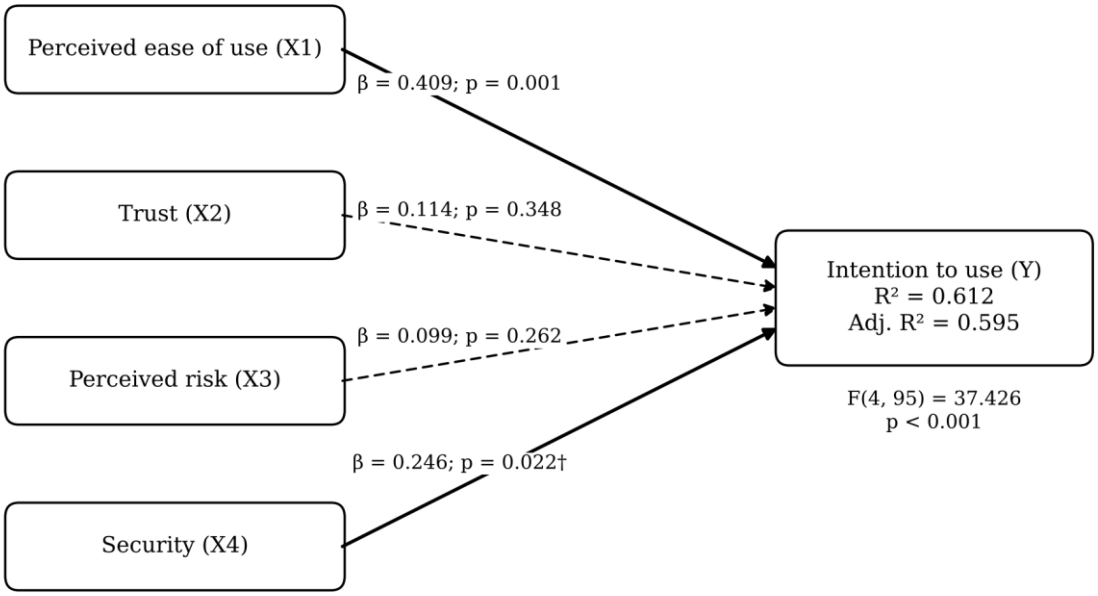


Figure 1. Estimated research model with standardized regression coefficients. Solid arrows: $p < 0.05$; dashed arrows: not significant; † significant with conventional and HC1 standard errors but marginal with HC3 standard errors ($p = 0.061$).

Source: Data processed by the authors.

Table 7 summarizes the outcomes of the hypothesis tests. H1 and H5 are supported; H4 is supported under conventional standard errors but should be regarded as tentative because of its sensitivity to the heteroscedasticity correction; and H2 and H3 are not supported.

Table 7. Summary of the Hypothesis Testing Outcomes

Hypothesis	Statement	Result
H1	Perceived ease of use (X1) has a significant partial relationship with intention to use (Y).	Supported
H2	Trust (X2) has a significant partial relationship with intention to use (Y).	Not supported
H3	Perceived risk (X3) has a significant partial relationship with intention to use (Y).	Not supported
H4	Security (X4) has a significant partial relationship with intention to use (Y).	Supported (conventional SE); marginal with HC3 SE
H5	X1, X2, X3, and X4 jointly have a significant relationship with intention to use (Y).	Supported

Source: Data processed by the authors.

3.5. Discussion

The results show that the four variables make different contributions to explaining the intention to use DANA in Samarinda City. In general, these findings are consistent with the extended TAM perspective that the intention to use a financial technology reflects both functional evaluations of the system and psychological assessments of the uncertainty involved in transactions (10,12). However, the study also reveals a distinctive pattern among DANA users in Samarinda: intention is most strongly associated with the practical convenience of the application and, to a lesser extent, with perceived transaction security,

whereas trust and perceived risk make no significant unique contribution once the other predictors are taken into account.

Perceived ease of use was the strongest predictor of intention to use (β = 0.409; p = 0.001), and this result was robust to heteroscedasticity-consistent estimation. Respondents' assessment of ease of use was in the high category (mean = 3.90), and ease of finding and using features (X1.3) loaded highest on the construct. This finding is consistent with the core proposition of TAM that a system perceived as free of effort is more likely to be adopted (11) and supports previous studies reporting a significant effect of ease of use on e-wallet intention (3,12,15,16,35). In contrast, it differs from studies among Generation Z in Kuala Lumpur and Generation X in Java, which found no significant effect (4,17). One possible explanation is that DANA integrates many services, such as transfers, bill payments, QRIS payments, and top-ups, so the ease of locating and operating these features remains a meaningful differentiator. Interestingly, an earlier study in the same city found that ease of use did not affect satisfaction with an online transportation application because it had become a baseline expectation (47). The present result suggests that, at the stage of forming usage intention for feature-rich financial applications, ease of use may still serve as a primary driver rather than merely a basic requirement, a proposition that warrants testing in comparative designs.

Trust did not have a significant unique association with intention to use (β = 0.114; p = 0.348), even though respondents' level of trust was high (mean = 3.83) and its bivariate correlation with intention to use was substantial (r = 0.692). This result is in line with the findings of Abdul-Halim et al. (20), who reported that trust did not influence e-wallet continuance intention in Malaysia, but contradicts several studies that identified trust as a key determinant (9,12,16–19). Three explanations, which should be treated as hypotheses rather than conclusions, are plausible. First, trust correlated strongly with perceived ease of use (r = 0.801) and security (r = 0.768); when these predictors are estimated together, the variance that trust shares with them cannot be attributed uniquely to trust, so its partial coefficient becomes small even though trust is clearly related to intention. Second, trust may operate indirectly, with security shaping intention through trust, as reported in studies in which the effect of security was transmitted mainly through trust (8,25); a mediation model would be required to test this possibility. Third, because DANA is licensed by Bank Indonesia and has a very large user base, trust may already be widely shared among its users, reducing the extent to which it differentiates users with high and low intention. The significant deviation-from-linearity test for trust is compatible with such a threshold or ceiling pattern, but the present data cannot establish it.

Perceived risk likewise showed no significant association with intention to use (β = 0.099; p = 0.262). Although the coefficient was positive, it was small and its 95% confidence interval (−0.069 to 0.251) included zero, so the data support neither a positive nor a negative effect, and the sign should not be interpreted substantively. Respondents perceived a fairly high level of risk (mean = 3.76), with the expectation of financial loss (X3.2) loading highest, yet this concern was not associated with lower intention. This finding is consistent with studies among Generation Z in Colombia and among users of Indonesian mobile payment applications that found no significant effect of perceived risk (9,22), but differs from evidence that perceived risk reduces the continuance intention to use mobile payment among Indonesian users (21). Several explanations can be proposed as hypotheses for future testing. Users may be aware of the risks of digital transactions but accept them as part of

everyday cashless life, particularly because most e-wallet transactions involve relatively small amounts; Gómez-Hurtado et al. (22) likewise argue that high trust and familiarity can neutralize the effect of perceived risk. Alternatively, the positive bivariate correlations between the risk items and all other constructs ($r = 0.33–0.52$) suggest either that more active users are also more aware of risks or that a shared response style, such as acquiescence or common method variance, affected the self-reported measures (48). In addition, the perceived risk scale showed weak psychometric properties ($\alpha = 0.600$; KMO = 0.499), which reduces the precision of its estimated coefficient. Accordingly, the results do not justify concluding that perceived risk is irrelevant; they indicate only that, in this sample and with this measure, it made no detectable unique contribution.

Security was positively associated with intention to use ($\beta = 0.246$; $p = 0.022$) and was the second strongest predictor. Respondents' assessment of security was high (mean = 4.00), with the reliable platform security system (X4.1) and the protection of personal information (X4.2) loading highest. This result supports previous studies that identified perceived security as a direct determinant of e-wallet intention (4,12,16,17,23,24), but differs from the finding of Ariningsih et al. (35) that security had no significant effect. However, the association was weaker and less robust than that of perceived ease of use: it remained significant with HC1 standard errors ($p = 0.047$) but was only marginal with HC3 standard errors ($p = 0.061$), and its unique contribution to the explained variance was modest (2.2%). The finding should therefore be regarded as suggestive rather than conclusive. Its practical relevance is nonetheless understandable in the current Indonesian context, in which reports of digital financial fraud have increased sharply (7); visible security features, such as PIN and biometric verification, transaction notifications, and fraud protection, may act as concrete cues that reassure users.

Jointly, the four predictors explained 61.2% of the variance in intention to use (adjusted $R^2 = 0.595$). The unexplained variance indicates that other factors, such as perceived usefulness, social influence, compatibility, and promotional benefits, are likely to contribute to users' intentions, as suggested by previous studies (3,4).

Conceptually, the results suggest that, in a mature market dominated by a few large platforms, the intention to use an e-wallet may be shaped more strongly by tangible experiences of usability, and to a lesser extent of security, than by general trust and abstract risk perceptions. We propose, as a hypothesis for future research rather than as a conclusion of this study, that trust and risk may function as background conditions that have been largely settled through regulation and widespread use, whereas ease of use and security remain the attributes that users actively evaluate. Testing this proposition requires designs that can separate shared from unique variance and establish temporal order, such as longitudinal or experimental studies and structural equation models with mediation paths.

From a practical perspective, these results are relevant to DANA's management in designing strategies that simplify navigation across features, keep the user interface intuitive, and make security mechanisms visible, accompanied by anti-fraud education for users. Regulators such as Bank Indonesia and the Financial Services Authority (OJK) can use the findings to reinforce consumer protection programs that strengthen public confidence in digital payments in the regions. Such measures support responsible digital transactions and contribute to sustainable digital financial inclusion under SDG 8 and SDG 9 (27,28).

4. Conclusions

This study examined the partial and simultaneous associations of perceived ease of use, trust, perceived risk, and security with the intention to use the DANA digital wallet in Samarinda City. With respect to H1, perceived ease of use was positively and significantly associated with intention to use and was the strongest predictor, and this result was robust to heteroscedasticity-consistent estimation. With respect to H2 and H3, trust and perceived risk had no significant unique association with intention to use, even though respondents reported relatively high levels of trust and risk awareness. With respect to H4, security was positively associated with intention to use under conventional standard errors, but this association was sensitive to the heteroscedasticity correction and should be interpreted with caution. With respect to H5, the four predictors jointly explained 61.2% of the variance in intention to use (adjusted $R^2 = 0.595$). Overall, the intention to use DANA in this sample was associated more with practical usability, and to a lesser extent with transaction security, than with general trust and risk perceptions.

In practical terms, DANA is recommended to simplify navigation across its features, maintain an intuitive interface, strengthen visible security mechanisms such as user verification, transaction notifications, and fraud protection, and expand anti-scam education for its users, while regulators can reinforce consumer protection measures that sustain public confidence in digital payments and support responsible, inclusive digital finance. This study has several limitations. The cross-sectional, self-reported design does not permit causal inference and may be affected by common method variance; the purposive online sample of 100 respondents from a single city, dominated by young and educated users, limits generalizability; eligibility was self-reported; the perceived risk and security scales showed only modest reliability, and the perceived risk scale had borderline sampling adequacy; and the use of multiple linear regression with observed composite scores does not account for measurement error. Future research should use probability-based or quota samples across Kalimantan, refine the perceived risk and security scales, include variables such as perceived usefulness, social influence, and promotional benefits, examine the mediating role of trust between security and intention and the moderating effects of age and income, and apply structural equation modeling or longitudinal designs to test the hypotheses proposed in this study.

Funding

This research was carried out without financial support from external funding agencies or organizations.

Acknowledgments

The authors sincerely acknowledge all respondents for their voluntary participation and valuable contributions to the data collection process. Their cooperation was essential to the successful completion of this study. The authors also extend their appreciation to the Center for Research and Community Service at Politeknik Negeri Samarinda (Samarinda State Polytechnic) for providing institutional support, research facilities, and administrative assistance throughout the research process.

Conflicts of Interest

The authors declare that there are no conflicts of interest associated with this research.

References

1. Untari PH. Data APJII: pengguna internet di Indonesia tembus 229,43 juta orang pada 2025. Bisnis.com [Internet]. 2025 Aug 6 [cited 2026 Oct 29]. Available from: https://teknologi.bisnis.com/read/20250806/101/1899997/data-apjii-pengguna-internet-di-indonesia-tembus-22943-juta-orang-pada-2025
2. Mayasari S. BI mencatat nilai transaksi QRIS capai Rp 164,48 triliun pada Januari 2026. Kontan.co.id [Internet]. 2026 Mar 12 [cited 2026 Oct 29]. Available from: https://keuangan.kontan.co.id/news/bi-mencatat-nilai-transaksi-qris-capai-rp-16448-triliun-pada-januari-2026
3. Che Nawi N, Al Mamun A, Hayat N, Seduram L. Promoting sustainable financial services through the adoption of eWallet among Malaysian working adults. SAGE Open. 2022;12(1):21582440211071107. doi:10.1177/21582440211071107
4. Ruslim TS, Herwindiati DE, Cokki. Adoption of e-wallet in the post-pandemic era: a study on Generation X's intention to use e-wallet. Innov Mark. 2024;20(2):267–80. doi:10.21511/im.20(2).2024.22
5. Anggraeni R. DANA klaim punya 180 juta pengguna, kelola 30 juta transaksi per hari. Bisnis.com [Internet]. 2024 Sep 26 [cited 2026 Oct 29]. Available from: https://teknologi.bisnis.com/read/20240926/84/1802754/dana-klaim-punya-180-juta-pengguna-kelola-30-juta-transaksi-per-hari
6. Husein AN. GoodStats Data [Internet]. 2026 [cited 2026 Oct 29]. 5 e-wallet favorit publik RI, DANA di puncak. Available from: https://data.goodstats.id/statistic/5-e-wallet-favorit-publik-ri-dana-di-puncak-LI1QF
7. Ritonga SZP. Kasus "scam" keuangan Indonesia tertinggi di dunia, OJK: sudah sangat darurat! Investortrust.id [Internet]. 2025 Oct 31 [cited 2026 Oct 29]. Available from: https://investortrust.id/financial/84089/kasus-scam-keuangan-indonesia-tertinggi-di-dunia-ojk-sudah-sangat-darurat
8. Prasetya ME, Shuhidan SM. Security, risk and trust in e-wallet payment systems: empirical evidence from Indonesia. Manag Account Rev. 2023;22(1):353–78.
9. Ansoria AD, Nugroho SS. The role of trust on the continuance usage intention of Indonesian mobile payment application. Gadjah Mada Int J Bus. 2024;26(2):231–57.
10. Marikyan D, Papagiannidis S. Technology acceptance model: a review. In: TheoryHub Book [Internet]. Newcastle upon Tyne: Newcastle University; 2024 [cited 2026 Oct 29]. Available from: https://open.ncl.ac.uk/theories/1/technology-acceptance-model/
11. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. 1989 Sep;13(3):319–40. doi:10.2307/249008
12. Belmonte ZJA, Prasetyo YT, Cahigas MML, Nadlifatin R, Gumasing MJJ. Factors influencing the intention to use e-wallet among generation Z and millennials in the Philippines: an extended technology acceptance model (TAM) approach. Acta Psychol (Amst). 2024;250:104526. doi:10.1016/j.actpsy.2024.104526
13. Gefen D, Karahanna E, Straub DW. Trust and TAM in online shopping: an integrated model. MIS Q. 2003 Mar;27(1):51–90. doi:10.2307/30036519
14. Featherman MS, Pavlou PA. Predicting e-services adoption: a perceived risk facets perspective. Int J Hum Comput Stud. 2003 Oct;59(4):451–74. doi:10.1016/S1071-5819(03)00111-3

15. Rahmawati M, Rosa A. Pengaruh persepsi manfaat dan persepsi kemudahan penggunaan terhadap minat menggunakan dompet digital DANA. Al-Kharaj J Ekon Keuang Bisnis Syariah. 2023;6(3):1395–406. doi:10.47467/alkharaj.v6i3.3785
16. Suryati S, Yoga I. The influence of perceived ease of use, trust and security on intention to use e-wallet. J Manag Islam Financ. 2021;1(2). doi:10.22515/jmif.v1i2.4692
17. Mustafa MA, Singh JSK, Ahmad NB. The adoption of e-wallet by Generation Z in Kuala Lumpur, Malaysia. Electron J Bus Manag. 2022;7(2):51–67.
18. Kesuma P, Nurbaiti N. Minat menggunakan e-wallet DANA di kalangan mahasiswa di Kota Medan. Jesya. 2023;6(1):694–703. doi:10.36778/jesya.v6i1.979
19. Riza AA, Aditya A. Evaluating the impact of trust and security on e-wallet adoption: insights from the UTAUT2 model in Indonesia. J Simantec. 2025;13(2). doi:10.21107/simantec.v13i2.29623
20. Abdul-Halim NA, Vafaei-Zadeh A, Hanifah H, Teoh AP, Nawaser K. Understanding the determinants of e-wallet continuance usage intention in Malaysia. Qual Quant. 2022;56(5):3413–39. doi:10.1007/s11135-021-01276-7
21. Putritama A. The mobile payment fintech continuance usage intention in Indonesia. Jurnal Economia. 2019 Oct;15(2):243–58. doi:10.21831/economia.v15i2.26403
22. Gómez-Hurtado C, Gálvez-Sánchez FJ, Prados-Peña MB, Ortíz-Zamora AF. Adoption of e-wallets: trust and perceived risk in Generation Z in Colombia. Span J Mark ESIC. 2025;29(4):425–43. doi:10.1108/SJME-01-2024-0017
23. Yapp EHT, Toh JQ, Lim XY. Factors driving intention to use e-wallet services in Malaysia. Glob Bus Manag Res. 2022;14(3s):523–35.
24. Khoiriyah SU, Zulkarnnaeni AS, Halim M. Pengaruh persepsi manfaat, persepsi kemudahan, dan persepsi keamanan terhadap minat menggunakan financial technology pada aplikasi Dana. JRAK. 2023;9(1):70–9. doi:10.38204/jrak.v9i1.950
25. Daragmeh A, Saleem A, Bárczi J, Sági J. Drivers of post-adoption of e-wallet among academics in Palestine: an extension of the expectation confirmation model. Front Psychol. 2022;13:984931. doi:10.3389/fpsyg.2022.984931
26. Ghofar M. Transaksi non-tunai Kaltim capai Rp13,78 triliun berkat sosialisasi. ANTARA Kalimantan Timur [Internet]. 2025 Mar 3 [cited 2026 Oct 29]. Available from: https://kaltim.antaranews.com/berita/233093/transaksi-non-tunai-kaltim-capai-rp1378-triliun-berkat-sosialisasi
27. United Nations General Assembly. Transforming our world: the 2030 Agenda for Sustainable Development [Internet]. New York: United Nations; 2015 Oct [cited 2026 Nov 18]. Report A/RES/70/1. Available from: https://sdgs.un.org/2030agenda
28. Ozili PK. Impact of digital finance on financial inclusion and stability. Borsa Istanb Rev. 2018 Dec;18(4):329–40. doi:10.1016/j.bir.2017.12.003
29. Demirgüç-Kunt A, Klapper L, Singer D, Ansar S. The Global Findex Database 2021: financial inclusion, digital payments, and resilience in the age of COVID-19. Washington, DC: World Bank; 2022. doi:10.1596/978-1-4648-1897-4
30. Creswell JW, Creswell JD. Research design: qualitative, quantitative, and mixed methods approaches. 6th ed. Thousand Oaks, CA: SAGE Publications; 2023.
31. Ali I, Azman A, Mallick S, Sultana T, Hatta ZA. Social Survey Method. In: Islam MR, Khan NA, Baikady R, editors. Principles of Social Research Methodology [Internet]. Singapore: Springer Nature Singapore; 2022 [cited 2025 Nov 17]. p. 167–79. Available from: https://link.springer.com/10.1007/978-981-19-5441-2_12 doi:10.1007/978-981-19-5441-2_12
32. Lwanga SK, Lemeshow S. Sample size determination in health studies: a practical manual. Geneva: World Health Organization; 1991.

33. Green SB. How many subjects does it take to do a regression analysis. Multivariate Behav Res. 1991 Jul;26(3):499–510. doi:10.1207/s15327906mbr2603_7
34. Etikan I, Musa SA, Alkassim RS. Comparison of convenience sampling and purposive sampling. Am J Theor Appl Stat. 2016;5(1):1–4. doi:10.11648/j.ajtas.20160501.11
35. Ariningsih EP, Wijayanti W, Prasaja MG. Intention to use e-wallet dilihat dari perceived usefulness, perceived ease of use, perceived security, dan trust. J Maksipreneur Manaj Koperasi Entrep. 2022;11(2):227–38. doi:10.30588/jmp.v11i2.916
36. Kaiser HF. An index of factorial simplicity. Psychometrika. 1974 Mar;39(1):31–6. doi:10.1007/BF02291575
37. Hair JF, Hult GTM, Ringle CM, Sarstedt M. A primer on partial least squares structural equation modeling (PLS-SEM). 3rd ed. Thousand Oaks, CA: SAGE Publications; 2022.
38. Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ. 2011 Jun 27;2:53–5. doi:10.5116/ijme.4dfb.8dfd
39. Meade AW, Craig SB. Identifying careless responses in survey data. Psychol Methods. 2012 Sep;17(3):437–55. doi:10.1037/a0028085
40. Ghozali I. Aplikasi analisis multivariate dengan program IBM SPSS 26. 10th ed. Semarang: Badan Penerbit Universitas Diponegoro; 2021.
41. Williams MN, Grajales CAG, Kurkiewicz D. Assumptions of multiple regression: correcting two misconceptions. Pract Assess Res Eval. 2013 Sep;18(11):1–14.
42. O'Brien RM. A caution regarding rules of thumb for variance inflation factors. Qual Quant. 2007 Oct;41(5):673–90. doi:10.1007/s11135-006-9018-6
43. Breusch TS, Pagan AR. A simple test for heteroscedasticity and random coefficient variation. Econometrica. 1979 Sep;47(5):1287–94. doi:10.2307/1911963
44. Koenker R. A note on studentizing a test for heteroscedasticity. J Econom. 1981 Sep;17(1):107–12. doi:10.1016/0304-4076(81)90062-2
45. Ramsey JB. Tests for specification errors in classical linear least-squares regression analysis. J R Stat Soc Series B Stat Methodol. 1969 Jul;31(2):350–71. doi:10.1111/j.2517-6161.1969.tb00796.x
46. Hayes AF, Cai L. Using heteroskedasticity-consistent standard error estimators in OLS regression: an introduction and software implementation. Behav Res Methods. 2007 Nov;39(4):709–22. doi:10.3758/BF03192961
47. Satryawati S, Hamdani H, Aditya R, Aksenta A, Syachrul S, Zunaidah U, et al. Exploration of customer satisfaction factors in the use of Maxim online transportation: an empirical study in the city of Samarinda. Asian J Environ Res. 2025;2(3):294–303. doi:10.69930/ajer.v2i3.590
48. Podsakoff PM, MacKenzie SB, Lee JY, Podsakoff NP. Common method biases in behavioral research: a critical review of the literature and recommended remedies. J Appl Psychol. 2003 Oct;88(5):879–903. doi:10.1037/0021-9010.88.5.879

CC BY-SA 4.0 (Attribution-ShareAlike 4.0 International).
This license allows users to share and adapt an article, even commercially, as long as appropriate credit is given and the distribution of derivative works is under the same license as the original. That is, this license lets others copy, distribute, modify and reproduce the Article, provided the original source and Authors are credited under the same license as the original.