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Quantitative analysis of the impact of electronic banking on the financial performance of rural banks in Indonesia

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A B S T R A C T

The rapid growth of electronic transactions has transformed the landscape of many industries, especially in the banking sector. This digitalization growth has brought about the need to understand the impact of the adoption of electronic banking in rural banks on the financial performance of rural banks in Indonesia. The aim of this research is to analyze the extent to which the adoption of e-banking influences consumer electronic trust (e-trust) and financial performance. The research method used is quantitative, involving data collection through questionnaires. Respondents in this study are managers of rural banks in West Java, Indonesia. The sample size used is 200 participants. Data collection took place over two months from May to June 2023. Data analysis was performed using Structural Equation Modeling (SEM) through SmartPLS 4 software. The research results indicate that the adoption of e-banking has a positive and significant impact on consumer e-trust and financial performance. Consumer e-trust has also been proven to mediate the relationship between e-banking adoption and financial performance. These findings provide profound insights into how e-banking plays a key role in building consumer e-trust and enhancing the financial performance of banking institutions. This research makes a significant contribution in the context of developing e-banking strategies in the banking sector. The implications of these findings can guide policies, strategies, and innovations in the banking sector to optimize the benefits of electronic banking, build consumer e-trust, and enhance financial performance in this digital era.

1. Introduction

The rapid development of digitization has acted as a catalyst for the fast-growing electronic transactions industry. This transformation has not only created new alternatives in financial services but has also altered the traditional landscape of the financial industry (Dai, 2020). Electronic transactions involve the use of information technology aimed at improving efficiency, accessibility, and user experience across various financial sectors. One key aspect of electronic transactions is the revolution in digital payments, where payment applications and digital wallets facilitate quick and easy transactions, reducing reliance on cash and conventional payment methods (Zhang & Kim, 2020; Rauniyar et al., 2021). Moreover, blockchain technology and cryptocurrencies have become integral parts of electronic transactions, introducing new ways of conducting transactions and transforming how financial assets and data are managed (Popescu, 2020). Electronic transactions also have a positive impact on the e-commerce sector by providing secure and efficient online payment solutions (Wendi et al., 2023). Additionally, electronic transactions offer technological solutions to meet financial regulatory requirements and ensure compliance. Through these various services, electronic transactions continue to reshape the way we interact with finance, presenting more inclusive, efficient, and responsive solutions to the demands of the digital age (Johansson et al., 2019).

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In this era of digital transformation, the banking sector needs to adopt e-banking to compete and remain relevant in the ever-evolving financial market (Lestari & Rahmanto, 2023). Integrating technology into banking operations can enhance process efficiency. Automating routine tasks through technology can reduce operational costs and the time needed to provide services to consumers (Musabegovic et al., 2019; Dwivedi et al., 2021; Varma et al., 2022). By utilizing digital platforms and applications, banks can deliver faster and more convenient consumer experiences. Furthermore, through electronic transactions, banks can strengthen security and data protection. Security technologies like blockchain, commonly used in cryptocurrency, can enhance transaction security and instill higher levels of electronic trust (e-trust) in consumers (Aysan et al., 2022). The adoption of e-banking also provides opportunities for banks to enhance consumer service. Digital banking applications, online payment services, and personal financial management are examples of e-banking innovations that can offer a better user experience, understand consumer needs more personally, and provide more responsive services (Barbu et al., 2021). Moreover, by engaging in electronic transactions, banks can collaborate with innovative startups and technology companies. Such alliances can accelerate innovation and help banks stay at the forefront of financial technology development (Carbó-Valverde et al., 2021). Furthermore, higher development of electronic transactions can assist financial institutions in developing innovative and responsive solutions to consumer needs (Lee et al., 2021; Rauniyar et al., 2021). The introduction of new products and services aligned with technological advancements can enhance consumer perception of the sophistication of the financial institution, build e-trust, and ultimately have a positive impact on financial performance by attracting more consumers and increasing revenue (Tun-Pin et al., 2019). Electronic transactions, in terms of e-banking, serve not only as a tool to improve efficiency but also as a catalyst for building and strengthening consumer e-trust, bringing positive impacts on overall financial performance. Thus, this research aims to analyze the extent to which the adoption of e-banking in financial institutions, particularly in rural banks, can impact consumer e-trust levels and the financial performance of the company.

2. Literature Review and Hypothesis Development

This research adopts the Technology Acceptance Model (TAM), a framework commonly used to understand and explain the acceptance and adoption of technology by users (Davis, 1989). The TAM theory has been foundational in numerous studies across various fields, including finance and technology. In the adoption of e-banking in banking companies, the use of the TAM theory can provide valuable insights into consumer acceptance and electronic trust (e-trust) in the financial technology applied by banking companies (Shaikh et al., 2020; Khatri et al., 2020). TAM emphasizes two main dimensions influencing technology acceptance, namely Perceived Ease of Use and Perceived Usefulness (Wicaksono & Maharani, 2020). Perceived Ease of Use encompasses how easy users feel the technology is to use, while Perceived Usefulness relates to how confident users are that the technology will enhance their performance and convenience in financial transactions (Rahmawati, 2019; Warsono et al., 2023). TAM identifies that Behavioral Intention to Use acts as a mediator between Perceived Ease of Use and Perceived Usefulness with the actual behavior of technology use. Therefore, in the context of this research, it can be analyzed to what extent the perceived usefulness and ease of use of electronic banking (e-banking) influence consumers' intention to use this technology (Putri et al., 2023). TAM also considers external factors that can moderate the relationship between the main variables. Some of these factors involve individual characteristics, such as previous experience with similar technology, risk perception, and social factors (Aysan et al., 2022). Hence, in this research, it can be considered how these moderating variables affect the relationship between perceived usefulness and ease of use with the intention and behavior of consumers in e-banking use in banking companies (Zakariyah et al., 2022; Varma et al., 2022). The use of the TAM theory in this research can provide a better understanding of the factors influencing consumer acceptance of e-banking in banking companies, thus offering more precise recommendations for enhancing technology adoption and building consumer e-trust in digital financial services in banking companies (Rahmiati & Jelitalia, 2021).

The adoption of e-banking in the banking sector is reflected through various types of e-banking, which serve as crucial indicators (Musabegovic et al., 2019; Varma et al., 2022). These e-banking services encompass several key features, namely internet banking, mobile payment, and SMS banking (Nwakoby et al., 2020). Mobile Payment is one indicator that signifies progress in digital financial services. Through mobile payment, consumers of banking companies can easily and quickly conduct financial transactions using mobile devices (Rachmawati et al., 2020). This includes bill payments, fund transfers, and even online product or service purchases. The use of mobile payment not only provides convenience but also reflects a transformation in the traditional way financial transactions are conducted (Bojjagani et al., 2023; Alnsour, 2023). Furthermore, SMS banking serves as another indicator of e-banking that enables consumers to access banking services through short messages (Musyaffi et al., 2021). This service allows consumers to receive balance information, perform transfers, and even access basic banking services without the need for an internet connection. SMS banking often becomes a more accessible alternative, especially for consumers with limited internet access (Bakry et al., 2021; Satria et al., 2021). Additionally, internet banking is another crucial indicator in the adoption of e-banking in banking companies. Through internet banking, consumers can access all banking services online. This includes account opening, inter-account fund transfers, investment portfolio management, and bill payments (Tsai & Su, 2021). Internet banking provides flexibility for consumers to manage their finances anytime and anywhere with internet access (Almaiah et al., 2022).

The adoption of internet banking, mobile payment, and SMS banking in banking companies reflects the commitment of these institutions to financial technology innovation. This not only enhances the operational efficiency of banking companies but also provides a better consumer experience (Majumdar & Pujari, 2022). By offering various electronic service options,

banking companies can meet the needs of an increasingly digital consumer base and strengthen their position amidst the constantly evolving financial market competition. Beyond improving efficiency, the adoption of these electronic services provides a better consumer experience. By offering diverse options, banking companies can better meet the needs of an increasingly digital consumer base, build closer relationships, and solidify their image as innovative financial institutions (Carbó-Valverde et al., 2021). Over time, this will create deeper electronic trust from consumers, consolidate the institution's position amid the ever-changing competition in the financial market, and ultimately result in good financial performance. Consumer e-trust is the primary foundation influencing consumer decisions to continue using services, transact regularly, and even recommend these services to others (Ayswarya et al., 2019; Iglesias et al., 2020).

Islam et al. (2021) stated that consumer e-trust can enhance consumer retention. Consumers who trust in the integrity, security, and quality of services will remain loyal. This reduces the consumer churn rate and generates a stable cash flow for the company. In the long run, strong consumer retention can help create a stable and sustainable financial foundation. Furthermore, consumer e-trust can also impact business growth (Kartika et al., 2020; Khan et al., 2022). Consumers who trust the company are more open to new products and services. Thus, banking companies can more easily expand their product and service portfolios, increase income diversification, and capture a larger market share. This e-trust can also create opportunities to offer more complex or investment-based financial products. Mulia et al. (2021) mentioned that consumer e-trust can stimulate positive word-of-mouth promotion. Satisfied and trusting consumers are more willing to recommend the company to their family, friends, or business associates. Word-of-mouth promotion can bring organic growth, reduce marketing costs, and create a positive impact on financial performance. From a broader financial perspective, consumer e-trust can create an environment where the company can more easily access funds, both through consumer deposits and investments (Mujahidin et al., 2022). This trust can influence financial ratios such as liquidity and solvency, enhancing the institution's resilience to market fluctuations. The creation of consumer e-trust is not only a critical element in building long-term relationships with consumers but also has a direct impact on financial performance. E-trust creates an environment that supports growth, consumer retention, and access to crucial financial resources for the continuity and sustainability of the financial institution (Hoang, 2019; Supriyanto et al., 2021). Thus, the following hypotheses are proposed:

Hypothesis 1: *E-banking has a positive effect on consumer e-trust.*
Hypothesis 2: *E-banking has a positive effect on on financial performance.*
Hypothesis 3: *Consumer e-trust has a positive effect on financial performance.*
Hypothesis 4: *Consumer e-trust is able to mediate the relationship between e-banking and financial performance.*

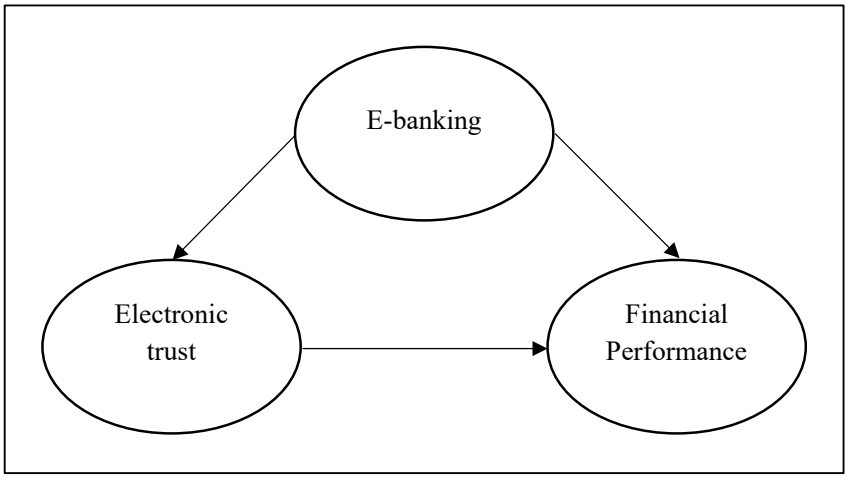

Fig. 1. Conceptual Framework

3. Research Method

This research employs a quantitative method with a survey approach using a questionnaire adopted from Alnsour (2023). A Likert scale ranging from 1 to 5 structures the questionnaire, where respondents provide responses to statements within this score range. The focus of this research is on rural bank managers in Indonesia, who are considered to possess insights and relevant experience regarding the adoption of e-banking in financial institutions. The random sampling technique is employed to select respondents, aiming to reflect diversity and ensure a good representation of rural bank managers in Indonesia. The initial questionnaire was distributed to 200 research respondents, but 15 did not return the questionnaire, and 9 questionnaires were incomplete. Therefore, the total number of questionnaires used as samples in this study is 166. Data collection occurred during the period from May to June 2023. This collection period is expected to capture variations and dynamics related to the adoption of e-banking in rural banks during that time. Data analysis will be conducted using the Structural Equation Modeling (SEM) technique, allowing researchers to evaluate the relationships between variables and measure the impact of these variables simultaneously. SmartPLS 4 software was chosen as the analysis tool to support SEM adoption. The advantage of

SmartPLS lies in its ability to handle complex models and provide reliable results, especially in research cases with relatively large samples.

4. Result and Discussion

The analysis conducted in the initial stage of this research involves the standard loading factor test to assess how well the questionnaire questions can effectively represent the items or indicators used. Three main variables in this study are e-banking, electronic trust, and financial performance. Each variable is measured through three different indicators. The e-banking variable is measured using indicators consisting of internet banking, mobile payment, and SMS banking. For the e-trust variable, indicators involving responsiveness, service reliability, and transaction security are used. Through the standard loading factor test, the values produced will provide an indication of how well the questionnaire questions can effectively represent each indicator. Obtaining loading factor values greater than 0.6 indicates that the questionnaire questions effectively reflect the measured indicators and indicate the reliability and validity of the questionnaire. The results of the standard loading factor test can be seen in Table 1.

Table 1
Standard Loading Factor

Variable	Indicator	Std. Loading Factor
E-banking	Internet Banking	0.927
	Mobile Payment	0.832
	SMS Banking	0.885
E-trust	Responsive	0.955
	Service Reliability	0.908
	Transaction Security	0.902
Financial Performance	Profitability	0.804
	Liquidity	0.889
	Efficiency	0.842

Table 1 shows the results of the standard loading factor analysis for each indicator. In the e-banking variable, the internet banking indicator has the highest standard loading factor of 0.927, followed by SMS banking with a value of 0.885, and mobile payment with a value of 0.832. These high values, all greater than 0.6, indicate that the questions related to these three electronic services effectively reflect each indicator, providing confidence that the questionnaire is reliable in measuring the adoption of e-banking. For the e-trust variable, the responsive indicator has the highest standard loading factor of 0.955, followed by service reliability with a value of 0.908, and transaction security with a value of 0.902. These obtained values, also greater than 0.6, strengthen the validity of the questionnaire in depicting the level of consumer e-trust in digital financial services. Meanwhile, in the financial performance variable, the Profitability indicator has a standard loading factor value of 0.804, Liquidity has a value of 0.889, and Efficiency has a value of 0.842. These values (>0.6) provide validity to the questionnaire in measuring financial performance. Furthermore, this study involves reliability and validity tests to evaluate the reliability and validity of the indicators in measuring latent variables. In this test, two main metrics are used: Cronbach's Alpha (α) or Composite Reliability (CR) to measure reliability, and Average Variance Extracted (AVE) to measure validity. In the reliability test, Cronbach's Alpha or Composite Reliability values greater than 0.7 indicate an acceptable level of reliability. High reliability indicates that the indicators are consistent with each other and can be relied upon to measure latent variables. In the validity test, Average Variance Extracted (AVE) values greater than 0.6 indicate an adequate level of validity. High validity indicates that the indicators indeed represent the latent variables measured well.

Table 2
Reliability and Validity

Variable	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
E-banking	0.858	0.891	0.778
E-trust	0.912	0.919	0.850
Financial Performance	0.800	0.800	0.715

Table 2 presents the results of reliability and validity analysis for each variable: e-banking, e-trust, and financial performance. For the e-banking variable, the obtained Cronbach's Alpha value is 0.858, and the Composite Reliability is 0.891. This indicates a good level of reliability, suggesting that the indicators used to measure e-banking, such as internet banking, mobile payment, and SMS banking, are consistent with each other and reliable. In the validity test, the Average Variance Extracted (AVE) value obtained is 0.778, signifying that the validity level confirms that the variance in these indicators can be well explained by the e-banking variable. For the E-trust variable, the Cronbach's Alpha value reaches 0.912, and the Composite Reliability is 0.919, indicating a very high level of reliability. This suggests that the indicators measuring consumer e-trust in digital financial services, such as responsiveness, service reliability, and transaction security, have high consistency. The AVE value of 0.850 reflects a very good level of validity, confirming that these indicators effectively reflect the latent e-trust

variable. In the financial performance variable, measured through indicators such as Profitability, Liquidity, and Efficiency, both Cronbach's Alpha and Composite Reliability obtained values of 0.800, indicating an adequate level of reliability. Additionally, the AVE value of 0.715 is acceptable, indicating a reasonable level of validity.

Table 3
Discriminant Validity (Cross Loading)

Dimension	E-banking	E-trust	Financial Performance
Internet Banking	0.927	0.411	0.428
Mobile Payment	0.832	0.304	0.292
SMS Banking	0.885	0.294	0.357
Responsive	0.386	0.955	0.446
Service Reliability	0.346	0.908	0.369
Transaction Security	0.338	0.902	0.397
Profitability	0.456	0.313	0.804
Liquidity	0.298	0.400	0.889
Efficiency	0.286	0.407	0.842

Furthermore, to test the validity of the indicators in measuring latent variables, discriminant validity testing (cross-loading) was also conducted to strengthen the results of the previous tests. In this case, the discriminant validity test (cross-loading) was performed to understand in detail how the indicators used to measure the latent variable under consideration have proven to have a high level of validity compared to other variables. From Table 3, it can be seen that the indicators of internet banking, mobile payment, and SMS banking have higher values in measuring the e-banking variable compared to other variables. Similarly, the indicators responsive, service reliability, and transaction security have higher values when measuring the e-trust variable compared to values for other variables. Furthermore, the indicators measuring the financial performance variable, namely Profitability, Liquidity, and Efficiency, also have higher values when measuring the latent variable under consideration compared to values for other latent variables. To determine the influence of relationships between variables, hypothesis testing was conducted. Hypothesis testing was performed to determine whether a relationship between variables has a positive and significant effect so that the hypothesis can be accepted or rejected. In this study, there are four hypotheses tested. The first hypothesis assumes that the adoption of e-banking has a positive impact on the level of consumer e-trust. The second hypothesis assumes that the adoption of e-banking has a positive impact on financial performance. The third hypothesis assumes that the level of consumer e-trust has a positive impact on financial performance. The fourth hypothesis assumes that the level of consumer e-trust can act as a mediator between the adoption of e-banking and financial performance. A hypothesis can be accepted if the T statistics obtained are greater than 1.96 or if the p-value is less than 0.05.

Table 4
Hypothesis Testing

	Hypothesis	T statistics	p-value	Information
H1	E-banking → E-trust	3.990	0.000	Significant
H2	E-banking → Financial Performance	2.811	0.006	Significant
H3	E-trust → Financial Performance	3.817	0.000	Significant
H4	E-banking → E-trust → Financial Performance	2.388	0.019	Significant

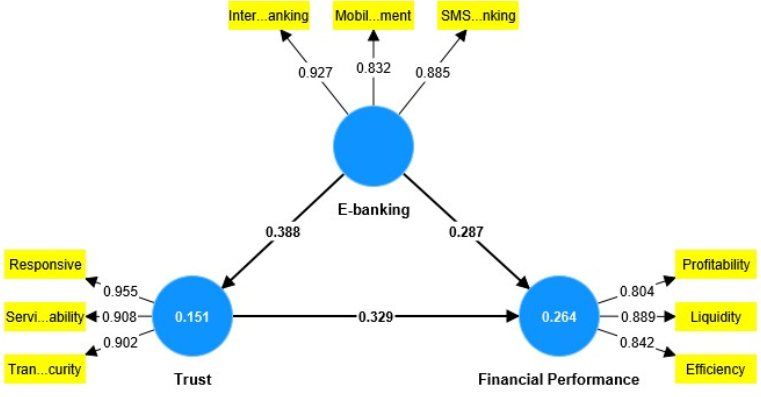

Fig. 2. Results of hypothesis analysis

The results of hypothesis testing in Table 4 indicate that in the first hypothesis testing, the relationship between e-banking and consumer e-trust, the T statistics value of 3.990 with a p-value of 0.000 shows that the relationship is significant. Therefore,

the hypothesis stating that the adoption of e-banking has a positive impact on the level of consumer e-trust is accepted. This is in line with the findings of Ayswarya et al. (2019), stating that by providing diverse options through e-banking, banking companies can better meet the needs of an increasingly digital consumer base, build closer relationships, and strengthen their image as an innovative financial institution, creating deeper e-trust from consumers. In the second hypothesis testing, the relationship between e-banking and financial performance, the T statistics value of 2.811 with a p-value of 0.006 indicates that this relationship is also significant. Thus, the hypothesis stating that the adoption of e-banking has a positive impact on financial performance is accepted. Next, the third hypothesis testing regarding the relationship between consumer e-trust and financial performance shows a T statistics value of 3.817 with a p-value of 0.000. This indicates that the level of consumer e-trust has a significant impact on financial performance. Therefore, the hypothesis stating that the level of consumer e-trust has a positive impact on financial performance is accepted. This finding is in line with Iglesias et al. (2020), stating that deeper consumer e-trust can strengthen the company's position in the dynamics of tight competition and ultimately create good financial performance. The same is also shown in the findings of Islam et al. (2021), where consumers who e-trust integrity, security, and service quality will remain loyal, reducing the consumer churn rate and generating a stable cash flow for the company. Finally, in the fourth hypothesis testing involving the mediation of consumer e-trust in the relationship between e-banking and financial performance, the T statistics value of 2.388 with a p-value of 0.019 indicates that this mediation is significant. This suggests that the level of consumer e-trust plays a significant mediating role between the adoption of e-banking and financial performance.

The findings of this study indicate that e-banking has a significant positive impact on both consumer e-trust and financial performance. With the increasing level of consumer e-trust resulting from the adoption of e-banking, rural banks can seize opportunities to build long-term relationships with consumers. Consumer e-trust becomes a key factor in financial decision-making, and by prioritizing transaction security and service quality, rural banks can strengthen their position in the market. Furthermore, the positive relationship between e-banking and financial performance highlights the crucial role of electronic transactions in supporting the financial performance of rural banks. Innovations such as internet banking, mobile payments, and SMS banking can significantly contribute to revenue generation and cost management. Additionally, the finding that consumer e-trust also has a positive impact on financial performance emphasizes the importance of building and maintaining e-trust as a top priority. Strategies emphasizing transparency, responsiveness, and consumer data protection can positively contribute to the business growth and profitability of rural banks. Finally, the mediating effect of consumer e-trust in the relationship between e-banking and financial performance provides additional insights into the role of e-trust as a crucial link between technology and financial outcomes. This suggests that, in addition to focusing on technological aspects, rural banks also need to pay attention to human factors and consumer relationships to optimize the positive impact of electronic transactions. This offers strategic insights for rural banks to design more effective measures in facing the increasingly digitized banking industry. By understanding the impact of these variables, rural banks can develop more sustainable strategies to enhance services, build consumer e-trust, and improve financial performance in the era of electronic transactions.

5. Conclusion

The results of the analysis indicate that e-banking has a significant positive influence on consumer electronic trust and financial performance. Consumer e-trust, acting as a mediator, also plays a crucial role in connecting electronic transactions adoption with financial outcomes in financial institutions. The increased consumer e-trust resulting from digital financial services can create opportunities for rural banks to strengthen consumer relationships, while the positive impact on financial performance suggests the potential for increased revenue and operational efficiency.

This study provides a crucial contribution to understanding the impact of financial technology adoption, particularly e-banking, on rural banks. Additionally, this finding provides a deeper understanding of the role of consumer e-trust as a determinant factor mediating the relationship between e-banking and financial performance. Therefore, beyond focusing solely on technological aspects, rural banks need to consider strategies that enhance consumer e-trust through transparency, data protection, and effective communication. By understanding the dynamics of the relationships between these variables, rural banks can design more adaptive and innovative strategies to address challenges and opportunities in this digital era. The implications of these findings can guide policies, strategies, and innovations in rural banks and the banking sector in general. Given the continuous evolution of technology, it is expected that future research will monitor the latest technological developments and how such innovations may impact consumer e-trust and financial performance in the banking sector.

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