

Original Research Article

Analysis of *Mobile Banking* Usage In Increasing Customer Trust and Loyalty

ABSTRACT

This research aims to analyze the influence of perceived risk and perceived benefit on customer trust and loyalty in the use of mobile banking services at Bank Rakyat Indonesia (BRI) within the Jabodetabek region. Mobile banking has become an essential component of the banking sector's digital transformation, providing customers with convenient, rapid, and secure transaction capabilities. Nonetheless, concerns persist regarding data security, financial risks, and trust in this technology. The study adopts a quantitative approach utilizing Partial Least Square-Structural Equation Modeling (PLS-SEM) to investigate the relationships among the variables.

The results demonstrate that perceived risk has a negative and significant impact on customer trust, while perceived benefit positively and significantly influences trust. Furthermore, trust serves as a key mediator, reinforcing the effect of perceived benefit and risk on customer loyalty. High customer loyalty is determined not only by perceived benefits but also by customers' trust in the security and dependability of mobile banking services.

This study contributes to the existing literature on digital banking, particularly in the context of developing countries, by underscoring the importance of managing risks and benefits to build customer trust and loyalty. It also advocates for the development of innovative features and enhanced security measures in mobile banking services to maintain customer loyalty, which is crucial for success in the era of digital banking.

Keywords: Mobile Banking, Customer Loyalty, Customer Trust, Perceived Risk, Perceived Benefit.

1. INTRODUCTION

FinTech has rapidly grown in Indonesia, in line with the rising adoption of digital technology within the banking sector (Idris Balaka et al., 2024; Indriastuti&Hidayat, 2021). Major Indonesian banks, such as BRI, BCA, Mandiri, BNI, and BTN, have integrated financial technology services to facilitate customers' transactions. One of these services is mobile banking, which allows customers to conduct banking activities using mobile devices such as cell phones, smartphones, and personal digital assistants (PDAs) (Arcand et al., 2017). Nevertheless, the introduction of such innovations is not always received positively by all customers. Some remain concerned about data security risks and the potential for financial losses, leading to challenges related to customer trust and loyalty (Indriastuti&Hidayat, 2021).

Data presented by CNBC Indonesia indicate that the number of users and the value of digital banking transactions in Indonesia continue to increase (Setiawati, 2024). During the first quarter of 2024 (year-on-year), banks such as BRI showed significant growth of 30.3%, while BCA experienced 9% growth. This aligns with global trends, where governments in various countries, including Saudi Arabia, support the development of mobile banking services through strategic policies and visions, such as Saudi Arabia's Vision 2030 (Baabdullah et al., 2019). These advances reflect shifting consumer behaviors that increasingly rely on digital technology in various activities, including financial transactions.

Amid the rapid expansion of mobile banking, questions arise regarding how perceived risk and perceived benefits influence customer trust and how this trust impacts customer loyalty (Triwardhani et al., 2023). Previous studies have shown that risk may lower trust, yet perceived benefits can mitigate this negative effect (Triwardhani et al., 2023). By focusing on bank customers who use mobile banking services in the Jabodetabek area, this study offers a fresh perspective on integrating risk and benefit variables as determinants of customer trust, ultimately driving customer loyalty. Such a focus is particularly relevant in the context of the ongoing evolution of digital banking services and financial institutions' efforts to retain customers amidst swift technological transformations.

2. LITERATURE REVIEW

2.1 CUSTOMER LOYALTY

Customer loyalty in the banking industry is defined as a long-term commitment by customers to continue choosing and using a particular bank's services, despite the availability of numerous alternatives (Subagiyo et al., 2022). According to Griffin's theory, this loyalty manifests through consistent transactional behavior and a strong emotional bond between customers and the bank. In the digital banking context, loyalty also results from satisfaction with services and interactions that foster trust and emotional connections (Abdillah et al., 2024). Within the Islamic banking sector, loyalty is marked by brand attachment, where customers select a bank not only for its services but also for its alignment with their values and ethics (Susanti & Gunanto, 2022). Other studies emphasize the quality of mobile banking services—namely speed, security, and meeting user expectations—as key factors reinforcing loyalty (Yusfiarto, 2021). For banks, customer loyalty extends beyond merely preserving market share to building mutually beneficial long-term relationships. Similar to trust in a marriage, loyalty requires banks to consistently fulfill, and even exceed, customer expectations to maintain this commitment (Hussain & Siddiqui, 2021). Consequently, customer loyalty emerges from a synergy of positive experiences, sustained satisfaction, strong trust, and an ethical alignment between the bank and its customers.

2.2 CUSTOMER TRUST

Customer trust is defined as customers' belief in a bank's integrity, honesty, and competence in safeguarding data confidentiality, protecting transactions, and delivering secure and reliable services (Kala Kamdjoug et al., 2022). In the realm of digital banking, the importance of trust heightens due to the increased cybersecurity risks, compelling banks to establish robust technological measures and privacy protection mechanisms (Jafri et al., 2024). For instance, research conducted in Jordan highlights that perceived security and technological reliability influence customers' willingness to adopt digital financial services (Alsmadi et al., 2022). Furthermore, trust mitigates uncertainty, as a high level of trust promotes loyalty despite potential challenges and risks in a digital ecosystem (Ryu & Ko, 2020). In addition, operational transparency—such as sharing clear information on security policies and data protection—further enhances customers' confidence in digital banking (Babina et al., 2024). Consequently, the higher the level of customer trust, the greater the likelihood that customers will continue using and recommending the bank's

digital services, thereby strengthening long-term relationships between banks and their clientele (Wang, 2023).

2.3 PERCEIVED RISK

Perceived risk in digital banking encompasses various concerns customers have regarding potential losses or failures when using services such as internet banking and mobile banking (Hu et al., 2019). According to Tanuwijaya & Zainul Arifin (2023), this perceived risk includes privacy threats and technical uncertainties, evoking caution comparable to driving on an unfamiliar road. Furthermore, Caroline (2021) highlights that perceived risk may relate to insufficiently realized benefits and societal acceptance issues, especially if mobile banking services are not widely embraced. In terms of convenience and advantages, (Susanti & Gunanto, 2022) emphasize that customers weigh security, stability, and practical benefits before adopting digital technologies—similar to evaluating various features when selecting a new vehicle. Additionally, Simanjorang & Chandra (2019) point out that uncertainty about whether the service can consistently meet customers' needs further amplifies the risk dimension of digital banking solutions. Hence, perceived risk represents a holistic consideration of data security, technical reliability, social acceptance, and service benefits in digital banking, ultimately influencing customers' decisions to adopt or reject such technologies.

2.4 PERCEIVED OF BENEFIT

Perceived benefit in the digital banking context reflects customers' belief that utilizing technologies such as mobile and internet banking can enhance the efficiency, effectiveness, and convenience of financial transactions. According to TP & Sumathy (2023) these benefits are evident through the reduced barriers to traditional banking when digital services are introduced in retail outlets, whereas Hasibuan et al., (2023) highlight the crucial role of ease of access in Islamic banking. This perspective is further reinforced by Hakeem & Ratnasari (2021), who emphasize that perceived benefit is closely associated with application usability, wherein user trust and acceptance increase as the system becomes more user-friendly. Additionally, Simanjorang & Chandra (2019) reveal that customers' belief in improved productivity and transaction effectiveness spurs the adoption of digital services. Similarly, Purnamasari et al., (2024) argue that tangible benefits—such as enhanced productivity, effectiveness, and transaction performance—drive customers' interest in embracing mobile banking. Completing this framework, Ly & Ly (2022) assert that perceived benefit encompasses the conviction that technology can simplify and accelerate banking activities, improve efficiency, and offer practical advantages. Consequently, the greater the perceived benefits, the more likely customers are to continuously utilize digital banking services.

3. HYPOTESIS

3.1 THE INFLUENCE OF CUSTOMER TRUST ON CUSTOMER LOYALTY

Customer trust plays a crucial role in shaping bank customer loyalty, as indicated by several studies highlighting a positive and significant relationship between trust and loyalty (Haron et al., 2020; Juliana et al., 2023; Muis et al., 2021; Phong & Anh, 2023). Nevertheless, some research also points to a negative or non-significant effect, particularly when customers feel threatened by potential security risks and insufficient assurances of protection (Hilmawan & Yanti, 2023; Sari, 2018; Susanti & Gunanto, 2022; Winasih & Hakim, 2021).

Hypotesis 1 (H_1): Customer Trust has a positive and significant effect on Customer Loyalty.

3.2 THE INFLUENCE OF PERCEIVED RISK ON CUSTOMER LOYALTY

Perceived risk in the context of digital banking has been shown to exert varying influences on customer loyalty, with some studies finding a positive effect (Aprilia, 2021; Purnamasari et

al., 2024) and others indicating a significantly negative impact (Esmaeili et al., 2021; Hasibuan et al., 2023; Marfuah&Ratnaningrum, 2024; Muis et al., 2021). Nevertheless, these findings converge on the importance of effectively managing risk to foster customer confidence in digital financial services (Hoang et al., 2021b). Banks must enhance security, transparency, and reputation to ensure that customers feel safe and protected when using digital banking services. Consequently, well-managed perceived risk not only mitigates consumer concerns but also sustains and strengthens their loyalty to the bank.

Hypotesis 2 (H₂): Perceived Risk has a positive and significant effect on Customer Loyalty.

3.3 THE INFLUENCE OF PERCEIVED OF BENEFIT ON CUSTOMER LOYALTY

Perceived benefit is one of the key factors driving customer loyalty in the digital banking context, with several studies demonstrating a positive and significant relationship between perceived benefit and loyalty (Hasibuan et al., 2023; Marfuah&Ratnaningrum, 2024; Rohmah&Arieaba, 2019). In other words, the greater the benefits customers perceive—such as convenient transactions, time efficiency, and cost savings—the higher the likelihood they will remain loyal to the bank and continue utilizing its services. From this standpoint, banks need to continuously innovate and enhance service quality to increase customers' perceived benefits and thus foster stronger loyalty.

Hypotesis 3 (H₃): Perceived Benefit has a positive and significant effect on Customer Loyalty.

3.4 THE INFLUENCE OF PERCEIVED RISK ON CUSTOMER TRUST

Perceived risk in digital banking can influence customer trust in various ways, with some studies identifying a positive effect (Saif et al., 2022; Susanti&Gunanto, 2022; Thusi&Maduku, n.d.). Other research indicating a significantly negative impact (Ahsan & Adhi, 2019; Muis et al., 2021; Sani & Ratmono, 2021). This finding suggests that perceived risk does not invariably undermine trust; under certain circumstances, effective and transparent risk management can actually enhance customers' confidence in the security and reliability of digital banking services. Therefore, banks must implement strategic measures to ensure robust security, transparency, and communication, thereby assuring customers that adequate risk protection is in place.

Hypotesis 4 (H₄): Perceived Risk has a positive and significant effect on Customer Trust.

3.5 THE INFLUENCE OF PERCEIVED OF BENEFIT ON CUSTOMER TRUST

Perceived benefits play a crucial role in building customer trust in financial technology services, such as internet banking and mobile banking. Shahzad et al., (2022) highlighted that perceived benefits reflect the extent to which customers believe that using these technologies enhances efficiency and convenience in their financial transactions. Previous studies have also demonstrated that perceived benefits significantly increase customer trust, ultimately strengthening their loyalty (Khoa & Huynh, 2022; Yuen et al., 2023). For instance, research by Nurfadilah&Samidi (2021) during the COVID-19 pandemic revealed that the perceived benefits of digital financial services significantly improved customers' positive attitudes toward such technologies. Therefore, high perceived benefits not only foster trust but also serve as a key factor in customers' adoption of financial technologies.

Hypotesis 5 (H₅): Perceived of Benefit have a positive and significant effect on Customer Trust.

3.6 CUSTOMER TRUST AS A MEDIATOR BETWEEN PERCEIVED RISK AND PERCEIVED OF BENEFIT ON CUSTOMER LOYALTY

Trust is a fundamental component that acts as a mediator between perceived benefits and perceived risks on customer loyalty in digital financial services. Research by Khoa & Huynh (2022) demonstrated that perceived benefits have a significant positive effect on loyalty through customer trust, while (Yuen et al., 2023) confirmed that trust strengthens the relationship between perceived benefits and loyalty in the context of delivery services. Furthermore, trust serves as a risk mitigation mechanism, as evidenced by Al-Hattami et al. (2023), where high trust can alleviate customer concerns about privacy and security, thereby enhancing user loyalty to digital services. Hence, trust becomes a key element in building customer loyalty by reducing the negative impact of perceived risks while maximizing the influence of perceived benefits on customer retention (Saoula et al., 2023; Ul Hassan et al., 2020).

Hypotesis 6 (H_6): Perceived Risk has a positive and significant effect on Customer Loyalty through Customer Trust.

Hypotesis 7 (H_7): Perceived Benefit has a positive and significant effect on Customer Loyalty through Customer Trust.

4. METHOD

This research was conducted in January 2025 in Indonesia, specifically within the Greater Jakarta area (Jabodetabek), with a particular focus on mobile banking users. A purposive sampling method was employed, targeting active mobile banking users who have been utilizing the service for a minimum of one year. A structured survey methodology was utilized to collect primary data from these users. The questionnaires were distributed via Microsoft Forms and were designed to obtain comprehensive information regarding the factors influencing customers to use mobile banking regularly and consistently. This approach ensures precise data collection and thorough analysis of how these factors affect mobile banking customers.

4.1. DESIGN STUDY

This research adopts a quantitative design with a descriptive-explanatory approach, aiming to describe phenomena and explain causal relationships among variables influencing customer loyalty in the context of digital banking services. This approach was selected due to its suitability for measuring numerical variables and identifying the relationships between perceived benefits, perceived risks, trust, and customer loyalty. Through the application of quantitative methods, this study is expected to yield measurable and statistically valid data, enabling objective conclusions that can be generalized to a wider population.

4.2. DATA ANALYSIS

The collected data were analyzed using the *Structural Equation Modeling* (SEM) method with Smart PLS software. This method was chosen for its ability to analyze complex relationships between latent variables, such as loyalty, trust, and perceived risk, which cannot be directly measured. *Partial Least Squares* (PLS) is a variance-based approach that is more flexible than covariance-based SEM, as it does not require a large sample size, normally distributed data, or continuous measurement scales (Ghozali & Latan, 2015). The analysis process includes testing the outer model to assess the validity and reliability of indicators and the inner model to evaluate relationships between latent variables and test research hypotheses (Prastowo & Rahmadi, 2023). This approach enables researchers to obtain deeper and more accurate insights into the factors influencing customer loyalty in the use of digital banking services.

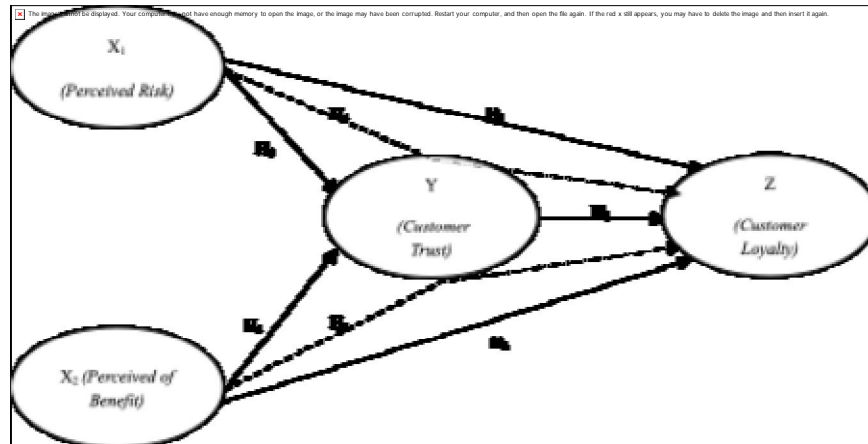


Figure 1. Theoretical Framework

Description :

- H1: Customer trust has a positive and significant effect on Customer Loyalty.
- H2: Perceived Risk has a positive and significant effect on Customer Loyalty.
- H3: Perceived Benefit has a positive and significant effect on Customer Loyalty.
- H4: Perceived Risk has a positive and significant effect on Customer Trust.
- H5: Perceived Benefit has a positive and significant effect on Customer Trust.
- H6: Perceived Risk has a positive and significant effect on Customer Loyalty through Customer Trust.
- H7: Perceived Benefit has a positive and significant effect on Customer Loyalty through Customer Trust.

5. RESULT

Based on the results of collecting online questionnaires from 180 respondents, the following data was found.

Table 1. Respondents and Profile

		Total	Percentage
Age	18-24 years	16	9%
	25-34 years	88	49%
	35-44 years	61	34%
	45-54 years	10	6%
	55-64 years	4	2%
	> 65 years	1	1%
Employment Status	State-Owned Employee	49	27%
	Enterprise	49	27%

	Private Sector Employee	58	32%
	Entrepreneur	38	21%
	Others	1	1%
	Student	4	2%
	Civil Servant	30	17%
Frequency of Using Mobile Banking (month)	5-10 times	86	48%
	> 10 times	74	41%
	> 50 times	20	11%
Duration of Use	> 1-3 years	49	27%
	> 3-5 years	86	48%
	> 5 years	45	25%

After collecting the responses, the researcher will conduct a descriptive statistical analysis, validity and reliability tests and outer & inner model test. The following are the results.

Table 2. Descriptive Analysis

	Missing	Mean	Median	Min	Max	Standard Deviation
CL1	0.000	4.756	5.000	3.000	5.000	0,324
CL2	0.000	4.739	5.000	3.000	5.000	0,322
CL3	0.000	4.722	5.000	3.000	5.000	0,336
CL4	0.000	4.728	5.000	2.000	5.000	0,350
CL5	0.000	4.706	5.000	2.000	5.000	0,356
CT1	0.000	4.689	5.000	2.000	5.000	0,360
CT2	0.000	4.750	5.000	2.000	5.000	0,334
CT3	0.000	4.744	5.000	2.000	5.000	0,344
CT4	0.000	4.761	5.000	2.000	5.000	0,338
CT5	0.000	4.739	5.000	2.000	5.000	0,345
PR1	0.000	4.744	5.000	2.000	5.000	0,344
PR2	0.000	4.722	5.000	2.000	5.000	0,351
PR3	0.000	4.750	5.000	2.000	5.000	0,342
PR4	0.000	4.733	5.000	2.000	5.000	0,347
PR5	0.000	4.722	5.000	2.000	5.000	0,351

PB1	0.000	4.733	5.000	2.000	5.000	0,340
PB2	0.000	4.756	5.000	4.000	5.000	0,298
PB3	0.000	4.772	5.000	3.000	5.000	0,300
PB4	0.000	4.806	5.000	3.000	5.000	0,284
PB5	0.000	4.822	5.000	3.000	5.000	0,275

Table 2 presents the descriptive statistical analysis of the perceived benefit variable (PB), including the mean and standard deviation for each item. The highest mean value, 4.822, is observed for item PB.5, which pertains to the statement, "I feel that digital banking services enhance efficiency in managing my financial transactions." This finding indicates a high level of agreement among respondents regarding the perceived benefit of improved productivity and transaction efficiency. Moreover, the standard deviation values for all items are lower than their corresponding mean values, signifying consistent responses and the absence of significant outliers in the dataset.

Table 3. Outer Loading

Customer Loyalty(Z)	Customer Trust (Y)	Perceived Risk(X1)	Perceived of Benefit(X2)
CL1	0,859		
CL2	0,920		
CL3	0,912		
CL4	0,905		
CL5	0,890		
CT1		0,852	
CT2		0,900	
CT3		0,932	
CT4		0,934	
CT5		0,921	
PB1			0,817
PB2			0,900
PB3			0,822
PB4			0,854
PB5			0,752
PR1		0,845	
PR2		0,911	
PR3		0,916	
PR4		0,916	
PR5		0,893	

Based on Table 3, the convergent validity test for each indicator in the questionnaire was conducted to ensure that each question item, as a measurement of a latent variable or construct in the questionnaire, can adequately explain its latent variable. Convergent validity is assessed based on the loading factor value of each question item, where a high correlation between the manifest variable and its construct indicates that the item is valid in a convergent sense. A loading factor value greater than 0.7 is considered acceptable, indicating that the questionnaire items meet the criteria for convergent validity. The data in Table 3 were processed using the PLS Algorithm, derived from the questionnaire responses collected from the respondents. Based on the data processing in the outer model, all indicators are declared valid in the convergent validity test.

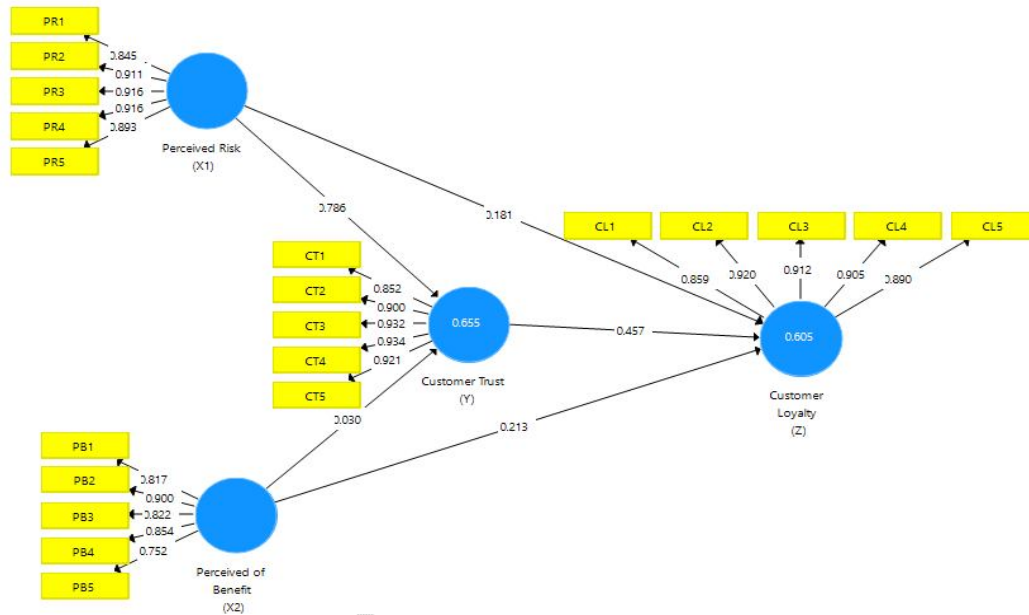


Figure 2. Output PLS Logarithm

From the PLS Algorithm output, the loading factor values for each indicator of the latent variables show values > 0.7 . Therefore, it can be concluded that the questionnaire items or statements for each variable—namely perceived risk, perceived benefit, customer trust, and customer loyalty—have successfully produced respondent data that is valid in terms of convergent validity.

Table 4. Validity and Reliability Test

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Customer Loyalty	0,940	0,946	0,954	0,805
Customer Trust	0,947	0,947	0,959	0,825
Perceived Risk	0,939	0,939	0,953	0,804

Perceived of Benefit	0,887	0,898	0,917	0,689
-----------------------------	-------	-------	-------	-------

Based on the validity and reliability tests, the Average Variance Extracted (AVE) values for each variable exceeded 0.5, indicating that the indicators for Customer Loyalty (0.805), Customer Trust (0.825), Perceived Risk (0.804), and Perceived Benefit (0.689) met the criteria for convergent validity. Furthermore, the Cronbach's Alpha values for these variables were Customer Loyalty (0.940), Customer Trust (0.947), Perceived Risk (0.939), and Perceived Benefit (0.887), all > 0.6, signifying that the questionnaire items produced reliable and consistent data. The Composite Reliability values also showed strong results, with Customer Loyalty (0.954), Customer Trust (0.959), Perceived Risk (0.953), and Perceived Benefit (0.917), all exceeding the threshold of 0.6. Therefore, it can be concluded that all research instruments are both convergently valid and reliable in measuring their respective constructs.

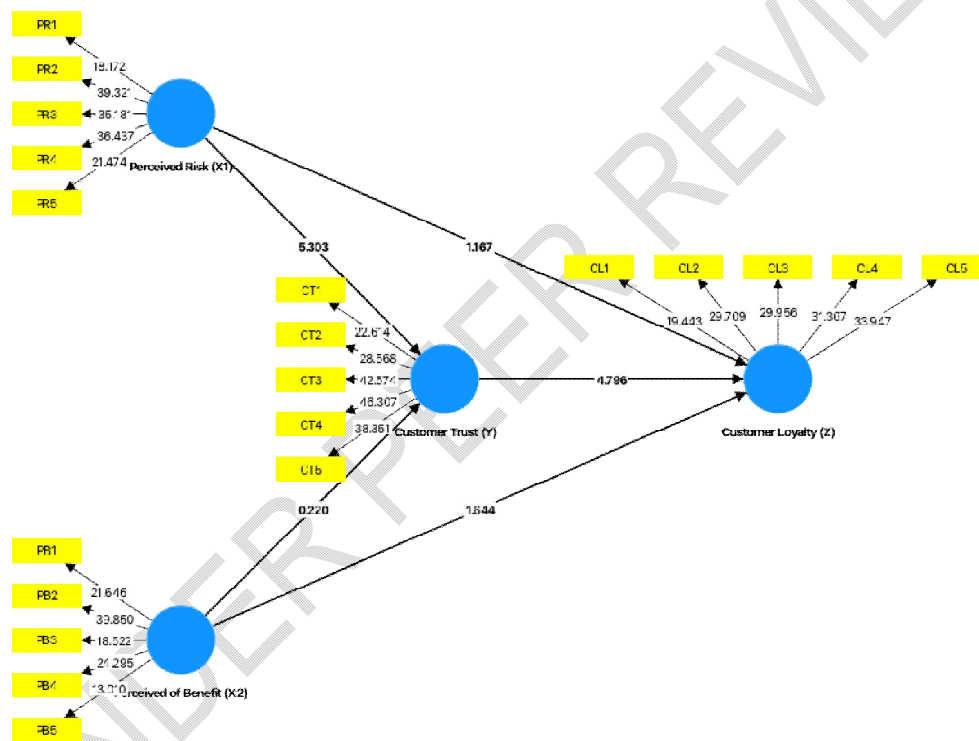


Figure 3. Output Bootstrapping

Table 5. Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Customer Trust (Y) -> Customer Loyalty (Z)	0,457	0,467	0,095	4,796	0,000
Perceived Risk (X1) -> Customer Loyalty (Z)	0,181	0,196	0,155	1,167	0,243

Perceived Risk (X1) -> Customer Trust (Y)	0,786	0,745	0,148	5,303	0,000
Perceived of Benefit (X2) -> Customer Loyalty (Z)	0,213	0,190	0,130	1,644	0,100
Perceived of Benefit (X2) -> Customer Trust (Y)	0,030	0,067	0,134	0,220	0,826
Perceived Risk (X1) -> Customer Trust (Y) -> Customer Loyalty (Z)	0,360	0,351	0,112	3,197	0,001
Perceived of Benefit (X2) -> Customer Trust (Y) -> Customer Loyalty (Z)	0,013	0,029	0,063	0,214	0,830

The hypothesis testing results reveal that Customer Trust (Y) has a positive and significant effect on Customer Loyalty (Z), with an original sample value of 0.457, t-statistic of 4.796 (> Z-score 1.96), and p-value of 0.000 (< 0.05), confirming the acceptance of hypothesis H1. Conversely, Perceived Risk (X1) does not have a significant effect on Customer Loyalty (Z) despite showing a positive direction (original sample 0.181, t-statistic 1.167 < Z-score 1.96, and p-value 0.243 > 0.05), leading to the rejection of hypothesis H2. Meanwhile, Perceived Risk (X1) has a positive and significant effect on Customer Trust (Y) (original sample 0.786, t-statistic 5.303 > Z-score 1.96, and p-value 0.000 < 0.05), supporting the acceptance of hypothesis H4. Additionally, Perceived Benefit (X2) does not have a significant effect on Customer Loyalty (Z) despite its positive direction (original sample 0.213, t-statistic 1.644 < Z-score 1.96, and p-value 0.100 > 0.05), resulting in the rejection of hypothesis H3, nor does it significantly influence Customer Trust (Y) (original sample 0.030, t-statistic 0.220 < Z-score 1.96, and p-value 0.826 > 0.05), rejecting hypothesis H5. Regarding mediation, Customer Trust (Y) significantly mediates the relationship between Perceived Risk (X1) and Customer Loyalty (Z) with a positive and significant direction (original sample 0.360, t-statistic 3.197 > Z-score 1.96, and p-value 0.001 < 0.05), supporting hypothesis H6. However, Customer Trust (Y) fails to mediate the relationship between Perceived Benefit (X2) and Customer Loyalty (Z) due to insignificance (original sample 0.013, t-statistic 0.214 < Z-score 1.96, and p-value 0.830 > 0.05), leading to the rejection of hypothesis H7.

Tabel 6. Analysis Results

Hypotesis	Result	Explanation
Customer Trust (Y) → Customer Loyalty (Z)	Accepted	Positive and significant.
Perceived Risk (X1) → Customer Loyalty (Z)	Rejected	Not significant.

Perceived Risk (X1) → Customer Trust (Y)	Accepted	Positive and significant.
Perceived Benefit (X2) → Customer Loyalty (Z)	Rejected	Not significant.
Perceived Benefit (X2) → Customer Trust (Y)	Rejected	Not significant.
Perceived Risk (X1) → Customer Trust (Y) → Customer Loyalty (Z)	Accepted	Positive and significant mediation.
Perceived Benefit (X2) → Customer Trust (Y) → Customer Loyalty (Z)	Rejected	Not significant mediation.

6. DISCUSSION

The results indicate that Customer Trust (Y) has a positive and significant effect on Customer Loyalty (Z) in the context of mobile banking usage among BRI customers in Jabodetabek, while Perceived Risk (X1) does not directly influence customer loyalty but significantly impacts customer trust. Additionally, Perceived Benefit (X2) does not significantly affect either Customer Loyalty (Z) or Customer Trust (Y), suggesting that perceived benefits alone are insufficient to foster loyalty without strong trust. The mediation of Customer Trust (Y) successfully bridges the relationship between Perceived Risk (X1) and Customer Loyalty (Z) but fails to mediate the relationship between Perceived Benefit (X2) and customer loyalty.

Overall, this study highlights the importance of trust as a key factor in building customer loyalty for mobile banking. While perceived benefits and risks play a role, the level of trust customers have in the service and the bank's reputation is the primary determinant of loyalty. Therefore, banks should focus on strategies that enhance customer trust, such as ensuring data security, providing high-quality services, and fostering transparent relationships, to encourage sustained mobile banking usage.

8. IMPLICATION

Based on the research results that have been conducted, several aspects requiring improvement and subsequent action steps that need to be implemented have been identified. The details of these are as follows:

8.1 THEORITICAL

This study makes a significant contribution to the theoretical framework of digital banking adoption by integrating perceived risks and benefits as key factors influencing trust and customer loyalty. It advances existing theories of consumer behavior, particularly in the context of financial technology in developing countries. The research highlights the pivotal role of trust as a mediating variable between perceived risks, benefits, and loyalty, suggesting that banks should prioritize trust-building strategies. Furthermore, this study enriches the literature by addressing a research gap, emphasizing how risk perception can be mitigated through perceived benefits in fostering customer retention and satisfaction. This theoretical model can serve as a basis for future studies in similar contexts or industries.

8.2 PRACTICAL

The findings provide actionable insights for banks, particularly BRI, to enhance their mobile banking services. Firstly, there is a need to improve the security measures of mobile banking

platforms to alleviate customer concerns about data privacy and financial safety. This includes implementing robust encryption, frequent security updates, and transparent communication about safety protocols. Secondly, banks should focus on optimizing user interfaces and introducing features that increase accessibility and ease of use for diverse customer demographics. Thirdly, effective communication about the benefits of mobile banking, such as convenience and efficiency, can help counterbalance perceived risks and foster customer trust. Lastly, developing educational campaigns to increase customer awareness of digital banking benefits and risk mitigation strategies can strengthen loyalty and usage rates.

9. LIMITATION

Several limitations of this study should be acknowledged. First, the research was geographically restricted to customers of BRI in the Greater Jakarta area, which may limit the generalizability of the findings to other regions or customer bases. Second, the respondent sample lacked significant demographic diversity, potentially overlooking the perspectives of different age groups, income levels, or educational backgrounds. Third, the reliance on a quantitative approach, while providing statistical rigor, limited the exploration of nuanced individual experiences and customer sentiments regarding mobile banking. Lastly, the study's temporal scope was narrow, meaning that shifts in technology, customer preferences, or regulatory environments occurring after the research period may not be reflected in the findings. Future research could address these limitations by incorporating a broader geographic scope, more diverse demographic samples, mixed-method approaches, and longitudinal study designs.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

REFERENCES

1. Abdillah, L., Asnawi, N., & Yuliana, I. (2024). Building a Customer Benefit Model Driven by Customer Satisfaction and Customer Loyalty Based on Digital Experience. *EL DINAR: JurnalKeuangan Dan Perbankan Syariah*, 12(1), 40–63. <https://doi.org/10.18860/ed.v12i1.25431>
2. Ahsan, S., & Adhi, P. (2019). Business Performance Analysis Based on Respondent Characteristics: Gender, Education Level and Age of Study in Tourism Villages of the Special Region of Yogyakarta. *Journal of Economics and Development* Vol 9, No 2 (2019)115-123, 9(2), 115–123. <https://doi.org/https://doi.org/10.12928/optimum.v9i2.13183>
3. Alsmadi, A. A., Alfityani, A., Alhwanmeh, L. N., Al_hazimeh, A. M., & Al-Gasawneh, J. A. (2022). Intentions to use fintech in the Jordanian banking industry. *International Journal of Data and Network Science*, 6(4), 1351–1358. <https://doi.org/10.5267/j.ijdns.2022.5.016>
4. Aprilia, N. E. (2021). Influence of Service Quality on Customer Loyalty Through Perceived Risk, Satisfaction, and Trust in Branchless Banking Customers. *BISMA: JurnalBisnis Dan Manajemen*, 15(1), 56. <https://doi.org/10.19184/bisma.v15i1.17764>
5. Arcand, M., PromTep, S., Brun, I., &Rajaobelina, L. (2017). Mobile banking service quality and customer relationships. *International Journal of Bank Marketing*, 35(7), 1068–1089. <https://doi.org/10.1108/IJBM-10-2015-0150>

6. Baabdullah, A. M., Alalwan, A. A., Rana, N. P., Kizgin, H., & Patil, P. (2019). Consumer use of mobile banking (M-Banking) in Saudi Arabia: Towards an integrated model. *International Journal of Information Management*, 44, 38–52. <https://doi.org/10.1016/j.ijinfomgt.2018.09.002>
7. Babina, T., Bahaj, S., Buchak, G., De Marco, F., Foulis, A., Gornall, W., Mazzola, F., & Yu, T. (2024). Customer Data Access and Fintech Entry: Early Evidence From Open Banking. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4720785>
8. Caroline, C. C. (2021). Analysis of Factors Affecting Customer Interest in Using M-Banking Based on TAM Theory. *KEUNIS*, 9(2), 160. <https://doi.org/10.32497/keunis.v9i2.2819>
9. Esmaeili, A., Haghgoo, I., Davidavičienė, V., & Meidutė-Kavaliauskienė, I. (2021). Customer Loyalty in Mobile Banking: Evaluation of Perceived Risk, Relative Advantages, and Usability Factors. *Engineering Economics*, 32(1), 70–81. <https://doi.org/10.5755/j01.ee.32.1.25286>
10. Ghozali, I., & Latan, H. (2015). Partial Least Squares: Concept, Technique and Application of SmartPLS 3.0 for Empirical Research. Diponegoro University Publishing Agency. https://lib.unsub.ac.id/index.php?p=show_detail&id=5191
11. Hakeem, G., & Ratnasari, R. T. (2021). The Effect of Perceived Ease of Use on Islamic General Bank M-Banking Applications with Trust as an Intervening Variable. *Journal of Islamic Economics Theory and Application*, 8(6), 696. <https://doi.org/10.20473/vol8iss20216pp696-705>
12. Haron, R., Abdul Subar, N., & Ibrahim, K. (2020). Service quality of Islamic banks: satisfaction, loyalty and the mediating role of trust. *Islamic Economic Studies*, 28(1), 3–23. <https://doi.org/10.1108/IES-12-2019-0041>
13. Hasibuan, P. S. N., Rinawati, L., & Harno, R. (2023). Digital Finance Adoption Strategy in Sharia BPR. *JOURNAL OF HUMANITIES SOCIAL SCIENCES AND BUSINESS (JHSSB)*, 2(3), 404–415. <https://doi.org/10.55047/jhssb.v2i3.587>
14. Hilmawan, A., & Yanti, H. B. (2023). Determinant Factors of Customer Loyalty Study on SeaBank Digital Bank. *Trisakti Journal of Economics*, 3(2), 2831–2840. <https://doi.org/10.25105/jet.v3i2.16981>
15. Hu, Z., Ding, S., Li, S., Chen, L., & Yang, S. (2019). Adoption Intention of Fintech Services for Bank Users: An Empirical Examination with an Extended Technology Acceptance Model. *Symmetry*, 11(3), 340. <https://doi.org/10.3390/sym11030340>
16. Hussain, H. I., & Siddiqui, D. A. (2021). The Effect of Customers Beliefs about Their Bank, on Their Loyalty in Islamic Banking Relationships, and Intention to Leave: The Role of Trust, Dissatisfaction with Banking Channels, Commitment, and Customer Intimacy. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3942002>
17. Idris Balaka, K., Rahman Hakim, A., & DwiSulistiany, F. (2024). Customer Information Theft in the Banking Sector: A Serious Threat in the Digital Era. *Yustitiabelen*, 10(2), 105–130. <https://doi.org/10.36563/yustitiabelen.v10i2.1167>
18. Indriastuti, D., & Hidayat, A. (2021). The Importance of Service Experience, Trust, and Satisfaction on Banking Customer Loyalty. *European Journal of Business and Management Research*, 6(3), 92–98. <https://doi.org/10.24018/ejbmr.2021.6.3.864>
19. Jafri, J. A., Mohd Amin, S. I., Abdul Rahman, A., & Mohd Nor, S. (2024). A systematic literature review of the role of trust and security on Fintech adoption in banking. *Heliyon*, 10(1), e22980. <https://doi.org/10.1016/j.heliyon.2023.e22980>

20. Juliana, J., Nurhaliza, F., Hermawan, R., & Marlina, R. (2023). Bank Syariah Indonesia Customer Loyalty After Merger: Analysis of Trust, Service Quality, and Religiosity. *JurnalEkonomi Syariah Teori Dan Terapan*, 10(1), 96–108. <https://doi.org/10.20473/vol10iss20231pp96-108>
21. Kala Kamdjoug, J. R., NdassiTeutio, A. O., TchakounteTchouanga, U., &Gueyie, J.-P. (2022). Use of E-Banking and Customer E-Engagement in Developing Countries: Case of NFC Bank Cameroon. *Theoretical Economics Letters*, 12(05), 1378–1406. <https://doi.org/10.4236/tel.2022.125076>
22. Khoa, B. T., & Huynh, T. T. (2022). How do customer anxiety levels impact relationship marketing in electronic commerce? *Cogent Business & Management*, 9(1). <https://doi.org/10.1080/23311975.2022.2136928>
23. Ly, B., & Ly, R. (2022). Internet banking adoption under Technology Acceptance Model—Evidence from Cambodian users. *Computers in Human Behavior Reports*, 7, 100224. <https://doi.org/10.1016/j.chbr.2022.100224>
24. Marfuah, &Ratnaningrum, D. (2024). Determinants Of Customer Re-Interest In Using The Mobile Banking Of Bank Syariah Indonesia: A Review Of The Technology Acceptance Model Theory. *Media RisetAkuntansi, Auditing &Informasi*,24(No. 1), 87–106. <http://dx.doi.org/10.25105/mraai.v24i1.18410>
25. Muis, M. R., Fahmi, M., Prayogi, M. A., &Jufrizen, J. (2021). Model of Increasing Internet Banking Customer Loyalty Based on Risk Perception, Privacy Perception Mediated by Trust and Customer Satisfaction. *Journal of Business and Management*, 8(1). <https://doi.org/10.26905/jbm.v8i1.5042>
26. Nurfadilah, D., & Samidi, S. (2021). How the Covid-19 Crisis Is Affecting Customers' Intention To Use Islamic Fintech Services: Evidence From Indonesia. *Journal of Islamic Monetary Economics and Finance*, 7. <https://doi.org/10.21098/jimf.v7i0.1318>
27. Phong, V. T., & Anh, V. M. D. (2023). Impact of the Bank's Image and Reputation on Customer's Loyalty through Customer's Trust: A Case of Commercial Banks in Ho Chi Minh City. *Open Journal of Business and Management*, 11(05), 2652–2685. <https://doi.org/10.4236/ojbm.2023.115145>
28. Prastowo, S. L., &Rahmadi, R. (2023). Is brand awareness able to moderate promotion, product quality and innovation on purchasing decisions? *Journal of Business and Management Inspiration*, 6(2), 153. <https://doi.org/10.33603/jibm.v6i2.7798>
29. Purnamasari, V., AyuKinanti, S., &DestiaWahyuningsih, R. (2024). How Far Do Mobile Banking Apps Support Digital Finance Inclusion? *KnE Social Sciences*. <https://doi.org/10.18502/kss.v9i4.15073>
30. Rohmah, F., &Arieiba, I. Z. (2019). The Influence of Relational Benefits on Customer Satisfaction and Loyalty. *BUSINESS SKETCH*, 5(2), 72–85. <https://doi.org/10.35891/jsb.v5i2.1585>
31. Ryu, H.-S., & Ko, K. S. (2020). Sustainable Development of Fintech: Focused on Uncertainty and Perceived Quality Issues. *Sustainability*, 12(18), 7669. <https://doi.org/10.3390/su12187669>
32. Saif, M. A. M., Hussin, N., Husin, M. M., Alwadain, A., & Chakraborty, A. (2022). Determinants of the Intention to Adopt Digital-Only Banks in Malaysia: The Extension of Environmental Concern. *Sustainability*, 14(17), 11043. <https://doi.org/10.3390/su141711043>
33. Sani, E. I., &Ratmono, R. (2021). The Influence of Technology Perception and Risk Perception on the Trust of Conventional BRI M-banking Users (Study on FEB UM Metro Students). *DIVERSIFICATION Management Journal*, 1(4), 896–906. <https://doi.org/10.24127/diversification.v1i4.952>
34. Saoula, O., Shamim, A., Mohd Suki, N., Ahmad, M. J., Abid, M. F., Patwary, A. K., & Abbasi, A. Z. (2023). Building e-trust and e-retention in online shopping:

- the role of website design, reliability and perceived ease of use. *Spanish Journal of Marketing - ESIC*, 27(2), 178–201. <https://doi.org/10.1108/SJME-07-2022-0159>
35. Sari, N. (2018). Service Quality, Company Image, Trust and Its Influence On Customers' Satisfaction and Loyalty at Bank Syariah Mandiri (BSM) Meulaboh Branch Office. *Jurnal Ilmiah Peuradeun*, 6(2), 235. <https://doi.org/10.26811/peuradeun.v6i2.221>
 36. Setiawati, S. (2024, June 10). Cashless is increasingly popular, here are 5 digital banking choices for Indonesian citizens. Cashless is increasingly popular, here are 5 digital banking choices for Indonesian citizens.
 37. Shahzad, A., Zahrullail, N., Akbar, A., Mohelska, H., & Hussain, A. (2022). COVID-19's Impact on Fintech Adoption: Behavioral Intention to Use the Financial Portal. *Journal of Risk and Financial Management*, 15(10), 428. <https://doi.org/10.3390/jrfm15100428>
 38. Simanjorang, E. F. S., & Chandra, H. (2019). Factors Influencing Customer Decisions to Use PT. Bank Mestika Rantauprapat Internet Banking Services. *ECOBISMA (JOURNAL OF ECONOMICS, BUSINESS AND MANAGEMENT)*, 3(1), 78–92. <https://doi.org/10.36987/ecobi.v3i1.693>
 39. Subagiyo, R., Mutafarida, B., Nur Asiyah, B., Bachtiar, J., & Fauzan, F. (2022). Islamic Bank Customer Loyalty: An Analysis of Griffin's Theory and Relevant Research. *ULUL ALBAB Journal of Islamic Studies*, 23(1), 42–69. <https://doi.org/10.18860/ua.v23i1.15892>
 40. Susanti, D. A., & Gunanto, E. Y. A. (2022). Factors Affecting Intention to Recommend Halal Cosmetic Products (Case Study in South Tangerang City). *Journal of Islamic Economics Theory and Application*, 9(4), 543–558. <https://doi.org/10.20473/vol9iss20224pp543-558>
 41. Tanuwijaya, A., & Zainul Arifin, A. (2023). Perception of Risk in the Use of M-Banking in Banking Services in Indonesia. *Distribusi - Journal of Management and Business*, 11(2), 165–180. <https://doi.org/10.29303/simpan.v11i2.308>
 42. Thusi, P., & Maduku, D. K. (n.d.). Dimensions of perceived risk of mobile banking apps: An empirical investigation of South African retail banking customers. 342–326. <https://doi.org/10.29007/v4j1>
 43. TP, J., & Sumathy, Dr. M. (2023). Unlocking The Potential: Examining The Fintech Adoption In Retail Sectors. *Journal of Surveys in Fisheries Sciences*. <https://doi.org/10.53555/sfs.v10i3.2412>
 44. Triwardhani, D., Pinem, D. B., Yuliniar, Y., Aryani, L., & Bernadin, B. (2023). Effect of trust, risk perception and diffusion of innovation on the adoption/use of internet banking in Indonesia. *JPPi (Indonesian Educational Research Journal)*, 9(3), 1657. <https://doi.org/10.29210/020232206>
 45. Ul Hassan, M., Iqbal, M. S., & Habibah, U. (2020). Self-Service Technology Service Quality: Building Loyalty and Intention Through Technology Trust in Pakistani Service Sector. *Sage Open*, 10(2). <https://doi.org/10.1177/2158244020924412>
 46. Wang, J.-S. (2023). Reconfigure and evaluate consumer satisfaction for Open API in advancing FinTech. *Journal of King Saud University - Computer and Information Sciences*, 35(9), 101738. <https://doi.org/10.1016/j.jksuci.2023.101738>
 47. Winasih, T., & Hakim, L. (2021). The Role of Satisfaction as a Mediating Variable of Service Quality and Customer Trust towards Customer Loyalty of Islamic Banks. *IQTISHADIA Journal of Economics & Islamic Banking*, 8(2), 205–221. <https://doi.org/10.19105/iqtishadia.v8i2.4152>
 48. Yuen, K. F., Koh, L. Y., Wong, Y. Q., & Wang, X. (2023). Sustainable crowdsourced delivery: A study of technological, health, value, and trust

antecedents of consumer loyalty. *Journal of Cleaner Production*, 405, 137010. <https://doi.org/10.1016/j.jclepro.2023.137010>

49. Yusfiarto, R. (2021). The relationship between m-banking service quality and loyalty: evidence in Indonesian Islamic Banking. *Asian Journal of Islamic Management (AJIM)*, 3(1), 23–33. <https://doi.org/10.20885/ajim.vol3.iss1.art3>

UNDER PEER REVIEW