The Role of Data Security and Trust in Banks Clients' Attitude for Adopting Fintech Applications

Abdallah Mohamed Abdallah EL-Hendawy
Researcher Master Of Business Administration
Faculty of Commerce, Mansoura University -
123456789ra.com@gmail.com

Dr. Saad Abdelhamid Metawea
Professor of Business Administration
Faculty of Commerce, Mansoura University

Abstract

Drawing on the technology acceptance model (TAM), this study aims to investigate the influence of financial technology applications' perceived security and users' trust in these applications on people usage of these applications. A total of 416 valid questionnaires were analyzed to test the structural and model of the study using Smart PLS 4. Results have clarified that perceived security has a significant positive influence on users' trust. Moreover, the influence of perceived security on both perceived ease of use and perceived usefulness was insignificant and significantly negative, respectively. On the contrary, perceived trust has a significant positive influence on both perceived ease of use and perceived usefulness. Both perceived ease of use and perceived usefulness have a significant positive influence on users' attitude. Finally, the study encourages the researchers to extend the TAM to have a clearer idea on the antecedents of adopting financial technology applications. Also, depending on its results, the study presents some recommendations to reinforce the popularity and people's acceptance of these applications.

Keywords: Technology Acceptance Model (TAM) – Financial Technology – Perceived Security – Perceived Trust.

Introduction:

The banking sector has faced such tremendous, noticeable changes and fluctuations in the last fifteen years. Globalization, digital transformation and financial crises in 2008 were the most important shake ups in the whole world. Hence, Banks had to deal with all these changes not to lose their credibility and financial position. As a result, banks have adopted suitable strategies and necessary

precautions to restore their customers' confidence and image (Youssef, 2018). One of these strategies is Financial Technology applications.

Financial technology has brought a revolution to the financial services industry (Rahul et al., 2022). It includes a variety of services such as funding, electronic payment methods, including e-wallets, e-aggregators, e-trading, e-insurance, and Bitcoin (Suryono et al., 2020). Meanwhile, the rapid advancement of wireless mobile technologies, particularly mobile applications, has empowered individuals with robust tools to access diverse services, including mobile payments, mobile learning, and mobile banking, among others (Rafique et al., 2020).

However, a clear understanding of what drives people to adopt these technologies is necessary for service providers to ensure that these technologies achieve their objectives. Techology acceptance model (TAM) is a perfect tool for this purpose.

Customer trust is defined as the belief that their personal and financial information is secure and not subject to misuse or unauthorized access. Even if we use an imperfect system, consumers want to believe that vendors, banks and credit card companies will not misuse their personal information (Abrazhevich, 2004). So, trust is an important variable to describe users' confidence in electronic services and electronic transactions (Chawla and Joshi, 2019).

Besides, FinTech applications increasingly handle sensitive personal and financial information, making data security paramount for their adoption and long-term success. According to Adegbite (2025), maintaining confidentiality, integrity, and availability of consumer data is essential, and this requires robust encryption, multi-factor authentication (MFA), and continuous monitoring systems. Complementing this need, recent systematic reviews have revealed that cyber threats—such as phishing, malware, ransomware, and API vulnerabilities—are among the most prevalent risks in FinTech environments, frequently undermining user trust and impeding adoption (Javaheri et al., 2023).

Moreover, in light of Egypt's Vision 2030 for digital transformation, the CBE's Board of Directors has enacted a series of directives. These include exempting customers from all charges related to bank transfers conducted through electronic channels (such as Internet and mobile banking applications) in Egyptian pounds, as well as waiving fees linked to interbank transfers within the Instant Payment Network. Effective from January 1st, 2024, these directives underscore the CBE's persistent endeavors to encourage broader adoption of digital financial services, promoting accessibility 24/7 in banking solutions.

Hence, this study extends the technology acceptance model (TAM) adding data security and users' trust to investigate determinants of customer's using the FinTech Apps Apps, the first payment app licensed by the Central Bank of Egypt (CBE). Moreover, it tries to analyze the role of customers' trust in this Apps and their perception of the data security of this Apps on their intention to adopt it. Therefore, in this paper, we raise the following questions:

RQ1: How does data security influence banks clients' attitude to adopt Fintech applications?

RQ2: What is the influence of banks clients' trust in fintech applications on their attitude to adopt these applications?

RQ3: To what extent do data security and banks clients' trust influence their attitude to adopt fintech application?

Taking research questions into consideration, objectives of the research can be mentioned as follows:

1) Investigating the direct effect of security on perceived trust.
2) Measuring the direct effect of security on the antecedents of users' attitude.
3) Examining the impact of perceived trust on the antecedents of users' attitude.
4) This Research will provided some recommendations for top management and marketers of banks in light of the Research results.

1.2) Literature review

FinTech apps have emerged as a revolutionary force in the financial services industry, revolutionizing the way individuals and institutions handle money, credit, investment, and financial management. In essence, FinTech apps are the use of technology in financial services to make them more accessible, efficient, and personalized (Hasan, 2025). It is considered as an innovation in the finance and banking industry that benefits a lot of customers through faster, better and cheaper services, as well as customers' demand for new alternative products and services (Hang and Nguyen ,2024).

Shuhaiber et al. (2025) define fintech applications as an innovative technological solutions designed to improve and simplify the delivery of financial services, such as digital payments, electronic lending, automated investing, and digital insurance.

Stewart and Jürjens (2018) delineate FinTech Apps as the utilization of technological platforms and mobile devices for accessing transactional updates,

monitoring bank and credit accounts, and receiving debit alerts through push notifications via SMS, applications, or alternative notification mediums.

Despite the substantial amount of research examining the process and techniques used to effectively accept the adoption of FinTech, there is still the absence of a complete model to depict the disruptive FinTech innovation process in terms of data security and trust. Current innovation adoption theories and models must be modified and improved to highlight the perspectives necessary for the FinTech adoption process (Stewart and Jürjens, 2018)

Davis (1989) introduced the Technology Acceptance Model (TAM), which was subsequently endorsed by Yang (2005) as one of the most comprehensive and widely supported frameworks for examining technology adoption. The primary aim of TAM was to identify the key factors that influence the use of computer technologies. In developing the model, Davis incorporated several core variables previously recognized as critical determinants of computer usage and employed a psychological theoretical foundation to conceptualize and hypothesize the relationships among these variables (Davis, 1989).

Data Security and Users' trust.

In recent years, the security of FinTech applications has emerged as a cornerstone in fostering customer trust and accelerating usage adoption. A systematic review by Waliullah et al. (2025) highlighted that cyber threats—such as phishing, malware, ransomware, and data breaches—pose significant barriers to digital banking adoption, and that robust security measures like multi-factor authentication, biometric protection, AI-driven fraud detection, and blockchain-based logging strongly mitigate these threats. Similarly, Heliyon's 2024 systematic review emphasized trust and security as among the most influential predictors of FinTech acceptance in banking environments. Empirically, studies using structural equation modeling in m-banking contexts (e.g., Almaiah et al., 2023) confirm that perceived security and reduced risk significantly enhance user trust and intention to use FinTech services . Complementing these findings, Zhang et al. (2023) showed in the Pakistani commercial banking sector that data security is a critical antecedent of customer trust and adoption intentions. In light of this robust and converging evidence, the following hypothesis is proposed for empirical testing:

H1: Security of FinTech applications has a significant positive influence on bank clients' trust in these applications.

Data security and Perceived usefulness (PU):

Prior research suggests that security concerns can significantly shape users' perceptions of a technology's utility (Featherman & Pavlou, 2003; Shin, 2021). If

users doubt the security of their data, they may perceive the service as less beneficial, regardless of its functional advantages. Recent studies highlight that FinTech adoption heavily depends on trust, which is closely tied to perceived security (Baber, 2022; Alalwan et al., 2023). When users trust that their data is secure, they are more likely to engage with the app's features, enhancing their perception of its usefulness. Conversely, high-profile data breaches and privacy scandals have heightened consumer skepticism, making PDS a crucial determinant of FinTech success (Liébana-Cabanillas et al., 2024). Given these findings, we propose the following hypothesis:

H2: Perceived Data Security (PDS) of FinTech Apps services will have a significantly affect perceived usefulness (PU).

Perceived Data Security and Perceived Ease of Use (PEOU)

Research indicates that when users perceive high security risks, they may engage in additional verification steps, hesitate during transactions, or avoid certain features altogether, thereby reducing the app's perceived simplicity (Venkatesh et al., 2012; Zhou, 2015). A study by Yang et al. (2023) found that security-related anxieties, such as fear of data breaches, increased cognitive load, making FinTech apps feel more cumbersome to use. Similarly, if users must frequently authenticate their identity or navigate complex privacy settings, their perception of ease diminishes (Alshurideh et al., 2024). Given these findings, we hypothesize that heightened security concerns may counteract the intuitive design of FinTech apps, leading to the following proposition:

H3: Perceived Data Security (PDS) of FinTech Apps services significantly and negatively affects Perceived Ease of Use (PEOU).

Perceived Trust and Perceived usefulness:

Prior research suggests that trust is a fundamental driver of technology acceptance, particularly in contexts involving financial risk (Gefen et al., 2003; McKnight et al., 2011). When users trust a FinTech app, they are more likely to perceive it as useful, as trust reduces uncertainty and enhances willingness to engage with its features.

Empirical studies support the notion that trust strengthens Perceived Usefulness (PU). For instance, Oliveira et al. (2016) found that trust in mobile payment apps significantly increased users' perception of their utility, as they felt more comfortable conducting transactions. Similarly, Alalwan et al. (2017) demonstrated that trust mediates the relationship between security assurances and

perceived usefulness, indicating that secure systems foster trust, which in turn enhances PU. Given these insights, we propose the following hypothesis:

H4: Perceived Trust in FinTech Apps services has a positive effect on Perceived Usefulness (PU).

Perceived Trust and Perceived Ease of Use:

Perceived Trust (PT) in FinTech applications refers to users' confidence in the reliability, integrity, and competence of the service provider to safeguard their financial interests and personal data. This trust dimension has been shown to significantly influence users' cognitive assessments of the technology's characteristics, including its ease of use.

Recent empirical studies demonstrate that when users trust a FinTech platform, they tend to perceive its interface and functionalities as more intuitive and less complex. A longitudinal study by Abbasi et al. (2023) on mobile payment adoption found that trust was the strongest predictor of PEOU, even more significant than actual interface design characteristics. Similarly, a meta-analysis by Oliveira et al. (2016) revealed that the PT-PEOU relationship is particularly strong in financial technologies compared to other digital services. Building on this established theoretical foundation and empirical evidence, we propose:

H5: Perceived Trust (PT) in FinTech Apps services has a positive effect on Perceived Ease of Use (PEOU).

Perceived Ease of Use and Attitude:

Recent studies emphasize that PEOU reduces cognitive barriers to FinTech adoption. When users find an app intuitive and straightforward, they experience lower anxiety and higher confidence in using it for financial transactions (Venkatesh et al., 2012; Alalwan et al., 2017). For instance, research by Gupta et al. (2023) found that consumers who rated mobile banking apps as easy to use exhibited stronger positive attitudes toward adopting them, even when they had limited prior experience with digital finance. Similarly, a study by Lee and Kim (2024) demonstrated that PEOU significantly enhances user satisfaction and trust, reinforcing a favorable attitude toward FinTech services. Given these findings, we hypothesize the following:

H6: Perceived Ease of Use (PEOU) of FinTech Apps will have a positive relationship with customers' attitude toward adopting FinTech Apps.

Perceived Usefulness and Attitude:

A study in Bangladesh integrating TAM and innovation resistance theory found that PU significantly shapes consumer attitudes toward mobile financial services (Himel et al., 2021). Similarly, in Indonesia and India, research on FinTech adoption demonstrated that PU and perceived ease of use are significantly and positively associated with users' attitudes toward FinTech offerings (Jisha, 2024). In peer-to-peer FinTech lending, PU was shown to have a statistically significant positive effect on user attitude. Moreover, a mobile money adoption study in Ghana concluded that higher perceived usefulness leads to a more favorable attitude toward these services (Nurjannah et al., 2024). Taken together, these findings underscore the crucial role of perceived usefulness in shaping user attitudes in FinTech environments, justifying the following hypothesis:

H7: Perceived Usefulness (PU) of FinTech apps will have a positive relationship with customers' attitude toward adoption.

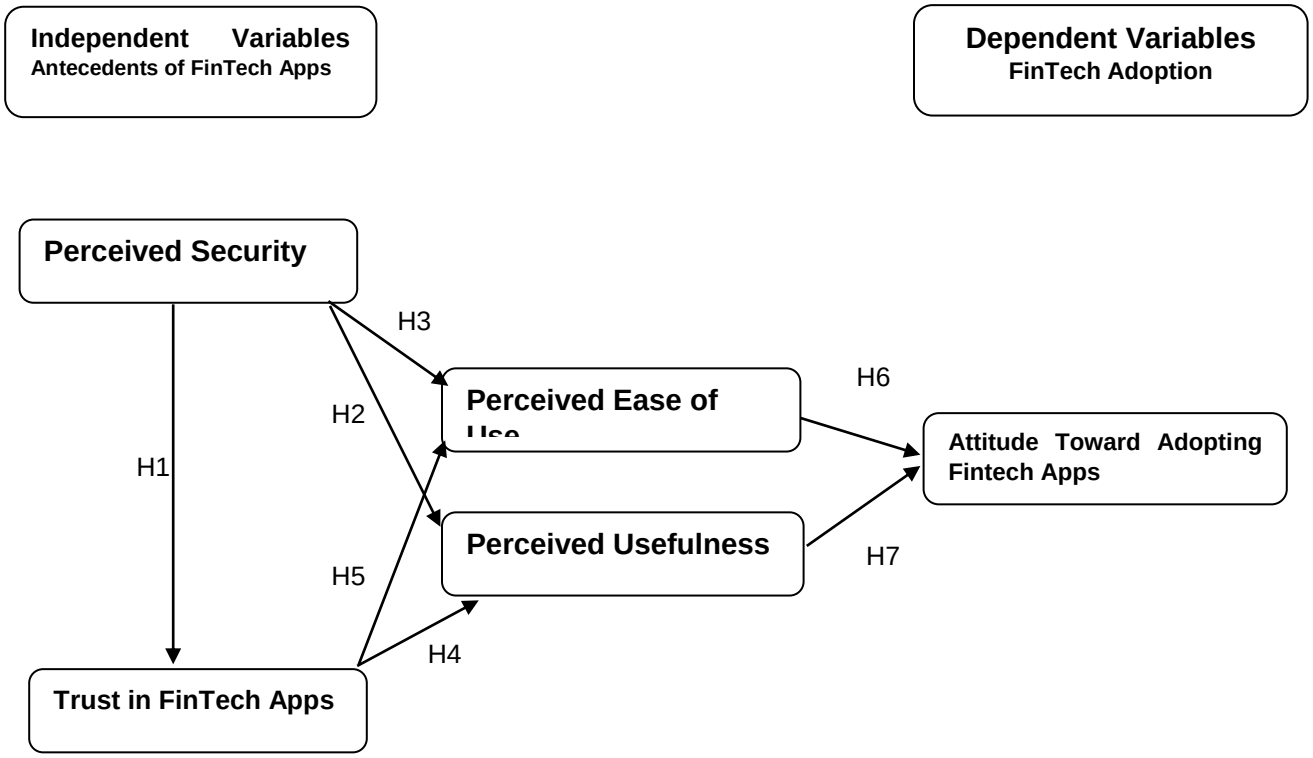

Figure (1.1) The Proposed Research Model and hypotheses

Methodology:

This study employed a quantitative research approach to assess customer perceptions regarding data security concerns and trust in relation to FinTech service adoption intentions (Ashley & Boyd, 2006). A questionnaire survey was used to collect data. The study used a well-structured approach that was adapted from previous studies. It consists of 25 items. The questionnaire consisted of three sections. The first section covered the antecedents of the attitude for FinTech applications adoption and included 22 items. It includes 7 items that were adopted from Stroborn (2004) and Nuridzul (2021). Also, it contains 5 items adopted from Prasetyo et al. (2021), Mukherjee and Nath (2003), and Kotler and Keller (2016). Moreover, it comprises 5 items that evaluate respondents' perceived ease of use, adopted from Prasetyo et al. (2021). Finally, the study adapted 5 items used by Mousa (2021) for evaluating PU. The second one is related to the attitude of the application adoption and includes 3 items which are adopted from Nuridzul (2021).

The study was applied to users of fintech applications (eg. Instapay, BM online, El-Ahly net, …… etc), including customers (aged 16 years and above) of public and private banks in the Arab Republic of Egypt, with a target population of 46.9 million, according to the central bank of Egypt[(1).] Moreover, given that the population exceeds 1,000,000, a confidence level of 95% and a standard deviation of 5% necessitate a minimum sample size of 384 (Saunders et al., 2019). To ensure robust data collection, the researcher depended on an electronic questionnaire and distributed 430 questionnaires. 14 responses were excluded due to inconsistencies in the responses. The final sample is 416 responses, and the demographic characteristics of this sample are outlined in the table 1.1.

As explained in table 1, most of the sample is from female 62.7%, while men represent only 37.3%. Regarding the respondents' marital status, 83.4% are single, and the rest (16.67%) are married. Concerning Age, respondents with a more than 50 years old are 4.8%, while most of the participants are less than 25. The remaining are between 25 and 50 years old. As for education, the majority of participants have a bachelor's degree, 78.1%, 16.1% of respondents have a postgraduate degree, and only 5.8% have no degree. As for the sample's employment, only 33.4% of respondents hold an occupational position, while the rest of the sample 66.6% are unemployed. Finally, regarding the type of banks respondents deal with, 84.1% are customers for public banks and only 15.9% deal with private banks.

(1) https://www.cbe.org.eg/ar/news-publications/news/2024/02/22/08/20/financial-inclusion-rates-rose-to-70,-d-,7-percent-by-the-end-of-2023 (accessed 13/4/2025)

Table (1) Demographic characteristics of the Sample

Factors	Demographic	Frequency	Percent
Gender	Male	155	37.3%
	Female	261	62.7%
Marital Status	Single	347	83.4%
	Married	69	16.6%
Age	Less than 25	250	67.3%
	25-50	116	27.9%
	More than 50	20	4.8%
Education	Without a degree	24	5.8%
	Bachelor	325	78.1%
	Postgraduate	67	16.1%
Employment	Unemployed	277	66.6%
	Employed	139	33.4%
Bank Type	Public Bank	350	84.1%
	Private Bank	66	15.9%

Source: Question (3) analysis.

Factor loading represents the correlation coefficient between individual measurement items and their corresponding principal component. Following established psychometric standards (Hair et al., 2019), four items (S2, S5, S6, and EU5) were eliminated from the analysis due to insufficient factor loadings below the recommended threshold of 0.5. The complete matrix of factor loadings is displayed in Table 2.

Table (2) Factor Loading

Factor		security	Trust	PEU	PU	AT
Perceived Security	**S1**	0.857				
	S3	0.902				
	S4	0.754				
	S7	0.779				
Perceived Trust PT	**T1**		0.851			
	T2		0.869			
	T3		0.847			
	T4		0.856			
	T5		0.827			
ea se of	**EU1**			0.891		

	EU2			0.856		
	EU3			0.883		
	EU4			0.927		
perceived usefulness	**U1**				0.727	
	U2				0.858	
	U3				0.921	
	U4				0.906	
	U5				0.784	
Attitude adopt	**AT1**					0.897
	AT2					0.913
	AT3					0.925

Source: Question (1,2) analysis

Cronbach's alpha evaluates reliability through the intercorrelations of observed indicators (Hair et al., 2017). As shown in Table 3, all values (Security = 0.833, Trust = 0.904, PEU = 0.912, PU = 0.898, AT = 0.899) exceed the 0.7 threshold recommended by Hair et al. (2017), indicating strong internal consistency of the scales. Moreover, Composite Reliability (CR) overcomes the limitations of Cronbach's alpha by accounting for differences in indicator loadings (Hair et al., 2017). Values below 0.7 are deemed unacceptable. As shown in Table 3, all CR values exceed this threshold (Security = 0.868, Trust = 0.904, PEU = 0.920, PU = 0.919, AT = 0.902), indicating acceptable reliability. Finally, Average Variance Extracted (AVE), a common measure of convergent validity, is calculated as the mean of squared indicator loadings. According to Hair et al. (2017), AVE values should exceed 0.50. As shown in Table 1.3, all constructs meet this criterion (Security = 0.666, Trust = 0.722, PEU = 0.792, PU = 0.710, AT = 0.831), confirming convergent validity.

Table (3) Internal Consistency and Composite reliability:

Factor	**Cronbach's alpha**	**Composite reliability**	**Average variance extracted (AVE)**
Security	0.833	0.868	0.666
Trust	0.904	0.904	0.722
PEU	0.912	0.920	0.792
PU	0.898	0.919	0.710
AT	0.899	0.902	0.831

Source: Question (1,2) analysis.

Discriminant validity reflects the extent to which a construct is empirically distinct from other constructs (Hair et al., 2017). This study assesses discriminant validity using three established approaches: (1) cross-loadings analysis, (2) the Fornell-Larcker criterion, and (3) the heterotrait-monotrait ratio (HTMT).

Table (6) Cross loading

Factors	security	Trust	PEU	PU	AT
S1	**0.857**	0.676	0.646	0.272	0.670
S3	**0.902**	0.768	0.634	0.476	0.680
S4	**0.754**	0.418	0.348	0.198	0.275
S7	**0.779**	0.599	0.441	0.495	0.479
T1	0.713	**0.851**	0.691	0.551	0.701
T2	0.714	**0.869**	0.641	0.557	0.591
T3	0.618	**0.847**	0.712	0.617	0.636
T4	0.659	**0.856**	0.752	0.563	0.670
T5	0.552	**0.827**	0.746	0.575	0.662
EU1	0.553	0.803	**0.891**	0.662	0.813
EU2	0.635	0.670	**0.856**	0.475	0.695
EU3	0.574	0.708	**0.883**	0.460	0.599
EU4	0.573	0.721	**0.927**	0.520	0.649
U1	0.424	0.331	0.281	**0.727**	0.333
U2	0.339	0.540	0.475	**0.858**	0.466
U3	0.464	0.638	0.515	**0.921**	0.472
U4	0.389	0.571	0.416	**0.906**	0.353
U5	0.342	0.649	0.721	**0.784**	0.567
AT1	0.610	0.647	0.704	0.466	**0.897**
AT2	0.595	0.744	0.732	0.527	**0.913**
AT3	0.648	0.703	0.703	0.474	**0.925**

Source: Question (1,2) analysis.

Table (7) Fornell-Lacker Criterion

Factors	AT	PEU	PU	Trust	security
AT	0.912				
PEU	0.782	0.890			
PU	0.537	0.603	0.842		
Trust	0.767	0.833	0.673	0.850	
Security	0.677	0.655	0.458	0.777	0.897

Source: Question (1,2) analysis.

Table (8) Heterotrait-Monotrait (HTMT)

	AT	PEU	PU	Trust	security
AT					
PEU	0.855				
PU	0.578	0.622			
Trust	0.849	0.811	0.719		
Security	0.744	0.729	0.519	0.867	0.795

Source: Question (1,2) analysis.

Based on these results, the scale of the study enjoys a solid level of discriminant validity. Regarding the descriptive statistics for the study variables, the results indicate that users view FinTech applications as secure, trustworthy, and user-friendly, with a clear tendency toward adoption.

Descriptive statistics reveal generally favorable perceptions of FinTech applications among users. Security recorded a moderate mean of 3.51 (SD = 0.749), indicating a reasonable sense of safety. Trust scored higher with a mean of 3.95 (SD = 0.711), reflecting strong user confidence in the reliability of these platforms. Perceived Ease of Use (PEU) had a mean of 4.14 (SD = 0.699), and Perceived Usefulness (PU) averaged 3.88 (SD = 0.792), suggesting that users find FinTech applications both intuitive and beneficial. Attitude scored the highest with a mean of 4.16 (SD = 0.698), pointing to a strong positive disposition toward adopting these technologies.

Table (9) Descriptive Statistics of the Study Variables

	N	Minimum	Maximum	Mean	Std. Deviation
Security	416	1.75	5.00	3.5144	.74916
Trust	416	1.80	5.00	3.9543	.71158
PEU	416	2.00	5.00	4.1442	.69892
PU	416	1.60	5.00	3.8764	.79287
AT	416	2.00	5.00	4.1603	.69803

Regarding the correlation between the study variables, table 2 shows the correlation matrix between the variables of the study. The highest correlation is between security and trust and the lowest one is between perceived usefulness and the attitude toward fintech application attitude.

Table (10) correlation matrix between variables

Security		Trust	PEU	PU	AT
security	1				
Trust	.722**	1			
PEU	.617**	.826**	1		
PU	.427**	.642**	.549**	1	
AT	.609**	.765**	.771**	.515**	1

** Correlation is significant at the 0.01 level (2-tailed)

Hypothesis Testing Results:

The study tested its hypotheses using Partial Least Squares (PLS) analysis via SmartPLS 3, with relationship significance determined by t-values and p-values.

Table (11) The direct effects between the study variables

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
security -> Trust	0.777	0.777	0.021	36.844	0.000
security -> PEU	0.019	0.020	0.051	0.376	0.707
security -> PU	-0.162	-0.164	0.057	2.871	0.004
Trust -> PEU	0.818	0.818	0.047	17.380	0.000
Trust -> PU	0.799	0.801	0.045	17.599	0.000
PEU -> AT	0.721	0.718	0.034	21.004	0.000
PU -> AT	0.102	0.105	0.044	2.315	0.021

H1 addresses whether security of fintech applications has a significant positive effect on customers' trust in these applications. Results asserted this positive relationship (B= 0.777, t= 36.844, and p= 0.000). Hence, H1 is accepted.

Second hypothesis evaluates the significant positive influence of security on the perceived ease of use for these applications. Results clarify that security

insignificantly influences customers' ease of use perception (B=0.019, t=0.367, and p=0.707). Then, H2 is rejected.

H3 proposes that security has a significant positive effect on users' perception toward the usefulness of these applications. Unexpectedly, results revealed a significant negative influence of security over PU (B= -0.162, t=2.871, and p=0.004). Hence, H3 is rejected.

Regarding the fourth hypothesis, trust has a significant positive influence on PEU. Results asserted the positive influence (B=0818, t=17.380, and p=0.000) and H4 is accepted.

H5 addresses whether users' trust in the fintech applications has a significant positive effect on perceived usefulness. Results asserted this positive relationship (B= 0.799, t= 17.380, and p= 0.000). Hence, H5 is accepted.

As presented in table 4, H6 evaluates the significant positive influence of users' trust in the fintech applications on the perceived usefulness for these applications. Results clarify that trust significantly and positively influences customers' perception toward FinTech application usefulness (B=0.799, t=17.599, and p=0.000). Then, H62 is accepted.

H7 addressed the influence of customers' PEU on their attitude toward using these applications. Results revealed that PEU has a significant positive relationship on users' attitude toward fintech applications (B=0.721, t=21.004, and p=0.000). Then, H7 is accepted.

Results and Recommendations:

The study established a significant positive relationship between perceived security and user trust in FinTech applications, indicating that users who perceive the platforms as secure are more likely to trust them. These findings align with Zhang et al. (2023) and are corroborated by Amnas et al. (2023), who emphasized the role of enhanced security in fostering user trust and promoting higher adoption rates. Conversely, the relationship between security and perceived ease of use (PEU) was found to be insignificant, leading to the rejection of the second hypothesis. One possible explanation is that increased security may introduce additional authentication steps or permissions, reducing convenience and usability—particularly for some users. This outcome is consistent with the findings of Siagian et al. (2022), who also reported that security does not significantly influence PEU.

The study identified a significant positive relationship between trust and PEU, suggesting that users who trust FinTech applications tend to perceive them as easier to use. This finding is in line with Kabakuş and Küçükoğlu (2022).

Additionally, trust demonstrated a significant positive influence on perceived usefulness (PU), indicating that trusted platforms are more likely to be viewed as effective tools for financial transactions—again supporting the results of Kabakuş and Küçükoğlu (2022). PEU was also significantly related to user attitude toward FinTech applications, suggesting that ease of navigation contributes to more favorable attitudes. This aligns with prior research by Sarkam et al. (2022), Singh and Kovid (2021), Mailangkay and Juwono (2023), and Khatri et al. (2020). Finally, the study confirmed a significant positive relationship between PU and user attitude, reinforcing earlier findings by the same authors that perceived usefulness positively influences adoption attitudes.

Conclusion

This study extended the Technology Acceptance Model (TAM) by incorporating data security and trust to better explain bank customers' adoption of FinTech applications. The extended model demonstrated a strong explanatory power, confirming that trust and perceived usefulness are critical drivers of user attitudes and ultimately, adoption behavior. Perceived security was found to play a foundational role by enhancing user trust, though its direct effect on perceived ease of use was not significant—highlighting the complexity of balancing security and usability in digital financial services.

The scientific contribution of this study lies in its integration of trust and data security into the well-established TAM framework within the context of FinTech, offering a more holistic understanding of user acceptance in a high-stakes, data-sensitive environment such as banking. The findings contribute to theoretical development by validating the extended TAM model and confirming the indirect influence of security through trust on core TAM constructs.

For decision makers, especially in banks and FinTech firms, the results underscore the importance of investing in robust data security systems not only to protect customer information but also to enhance user trust—an essential precursor to adoption. Additionally, ensuring that applications remain user-friendly despite security enhancements is vital. Efforts should be directed toward streamlining secure processes to maintain both functionality and customer satisfaction.

Future research should consider validating the extended model across different cultural and technological contexts to assess generalizability. Longitudinal studies are also recommended to explore how user perceptions evolve over time with exposure and experience. Moreover, incorporating additional variables such as perceived risk, digital literacy, and service quality could further refine understanding of FinTech adoption dynamics.

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