Acceptance and Use of Technology: The Influence on Consumption in the Colombian Banking Sector

Aceptación e uso da tecnoloxía: a influencia no consumo no sector bancario colombiano

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Abstract

This body of research aims to identify the relationship between elements of the Unified Theory of Acceptance and Use of Technology (UTAUT), the behavioral intention to use technology and the actual consumption of it among users in the Colombian banking sector. A factorial analysis and a structural equation model were used to analyze the impact of performance expectancy, effort expectancy, social influence and facilitating conditions on behavioral intention and the actual consumption of technology in a sample of 556 consumers from the Colombian banking sector. The results suggest that effort expectancy and facilitating conditions predict behavioral intention and actual use of technology in the studied population, whereas social influence and performance expectancy do not. In conclusion, financial entities are advised to understand consumer behavior to maintain relevant, competitive, and profitable relationships with their clients in a dynamic financial environment.

Keywords: Technology acceptance; Financial consumer; Consumer behavior; Banking sector.

Resumo

Este traballo de investigación pretende identificar a relación entre os elementos da Teoría Unificada de Aceptación e Uso da Tecnoloxía (UTAUT), a intención conductual de uso da tecnoloxía e o consumo real da mesma entre usuarios do sector bancario colombiano. Utilizouse unha análise factorial e un modelo de ecuacións estruturais para analizar o impacto da expectativa de desempeño, a expectativa de esforzo, a influencia social e as condicións facilitadoras sobre a intención conductual e o consumo real de tecnoloxía nunha mostra de 556 consumidores do sector bancario colombiano. Os resultados suxiren que a expectativa de esforzo e as condicións facilitadoras predín a intención de comportamento e o consumo real de tecnoloxía na poboación estudada, mentres que a influencia social e a expectativa de desempeño non o fan. En conclusión, recoméndase ás entidades financeiras entender o comportamento do consumidor para manter relacións relevantes, competitivas e rendibles cos seus clientes nunha contorna financeira dinámica.

Palabras chave: Aceptación da tecnoloxía; Consumidor financeiro; Comportamento do consumidor; Sector bancario.

JEL: M21; M31; G21.

1. INTRODUCTION

Digital transformation has permeated many aspects of contemporary society, and the banking sector is not exception (González Núñez & Mariné Osorio, 2021). The digitization of financial services is revolutionizing the way consumers interact with banking institutions, altering their consumption processes, as well as their habits and expectations (Kitsios et al., 2021). Digital transformation in the financial sphere has been characterized by the adoption of technology such as artificial intelligence, data analytics, cloud computing, and mobility (Camoiras-Rodríguez & Varela-Neira, 2020), innovations that have enabled financial institutions to offer more efficient, personalized, and accessible services (Tsindeliani et al., 2022); however, this change not only involves the modernization of technological infrastructure in banks but also a cultural and operational adaptation in their administrative processes (Alam et al., 2023).

Contemporary financial consumers seek effective, efficient, convenient, and secure banking experiences, scenarios in which digital transformation has responded to these demands with the introduction of online services, mobile applications, electronic payments, and virtual assistants (López-Rodríguez & Cardozo-Munar, 2023). Access to real-time financial information and the ability to conduct transactions anywhere has led to a shift not only in customer expectations but also in their consumption dynamics (Kaur et al., 2021).

Despite the evident benefits, Filotto et al. (2021) have stated that the adoption of digital transformation in the banking sector faces significant challenges. The digital divide, cybersecurity, and resistance to change are obstacles that must be overcome to ensure a successful transition (Cichosz et al., 2020). Consumer trust in the security of online transactions and data protection is a critical aspect that financial institutions must address to embrace the ever-growing demand for digital services (Kitsios et al., 2021). This process should not be entrusted to all market segments, as some may view digital transformation as a barrier, which would not only hinder the consumption of emerging banking services but also affect the brand value of banks (López-Rodríguez & Sandoval-Escobar, 2023; Calvo Dopico et al., 2021).

Digital transformation has influenced how consumers manage their finances, primarily due to the preference for online services, a trend that has reduced reliance on brick-and-mortar branches and has led to a shift towards digital banking models (Tsindeliani et al., 2022). The customization of supply and the ability to predict individual financial needs are aspects that have redefined the relationship between consumers and banking institutions (Louw & Nieuwenhuizen, 2020), a process that should be focused on customer experience as a key differentiator in the digital era (Monroy-Perdomo et al., 2022).

Digital transformation not only requires consumers to adapt to new technologies but also to understand how to use them safely and effectively by promoting financial education, an essential scenario to empower users and ensure that they make informed decisions in the digital environment (López-Rodríguez & López-Ordoñez, 2022). This consolidates technology acceptance, which is the ability to willingly receive and approve what is offered among all available forms of technology (Venkatesh et al., 2003); however, this acceptance has also revealed a generational gap when it comes to adopting digital services in the banking sector. While younger generations tend to quickly embrace new technology, older customers may be reluctant to do so (Parida et al., 2016; Laukkanen, 2016; Khanra et al., 2021), due to both psychological and functional barriers (Chaouali & Souiden, 2019).

For this reason, this study has been based on the Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al. (2003), which provides a solid framework that sheds light on which factors influence the adoption of new technology in the financial

domain, particularly in the banking sector. Challenges to be tackled regarding technological acceptance for the banking sector are greater integration of advanced technology and a deeper understanding of the psychological and functional factors that can affect consumers when deciding on whether to accept it.

Based on the above, this study addresses the following research question: How do the elements of the UTAUT sway the behavioral intention of account holders for technology use and their actual consumption in the Colombian banking sector? By providing an answer to this question, this study aims to enhance the understanding of various key aspects that the banking sector must consider for its digital transformation to be consolidated considering consumer behavior, thereby strengthening the market orientation of these entities. The next two sections present a literature review accompanied by the formulation of relevant hypotheses that support the validity of the research. After these two sections, the results of the empirical exercise are presented, followed by the Conclusions section, which includes theoretical and practical implications, limitations, and future research directions emerging from this study.

2. LITERATURE REVIEW

It is important to acknowledge that technology has enabled greater efficiency and convenience in the provision of banking services (Bhatt, 2021; Chaouali & Souiden, 2019). From the automation of administrative processes to the development of online payment systems, technology has simplified and expedited many everyday banking operations (Laukkanen, 2016), allowing consumers to have better user experiences. However, empirical research has identified that there are barriers to technology acceptance among customers (Venkatesh et al., 2003).

The increasing reliance on technology in banking services also presents significant challenges, not only for institutions but also for consumers (Leesakul et al., 2022). In this regard, there is a risk of financial exclusion for those who lack access to technology or do not know how to use it (Chaouali & Souiden, 2019). As banks close physical branches in favor of online services, those with no internet access or who are not comfortable conducting transactions online may be left behind (Laukkanen, 2016). This can widen the digital and financial divide, leaving some segments of society without access to essential banking services (Chung & Liang, 2020).

Colombian financial consumers find themselves immersed in an environment of transformation, marked by the convergence of technology and financial services. Due to the diversity of profiles, ranging from individuals with limited access to financial services to those with a high degree of technological literacy and familiarity, banking institutions that incorporate customer relationship management and market orientation into their corporate philosophy must understand consumer behavior to adapt their offerings to actual demand (Schulze et al., 2022). With the increasing market penetration of the internet and the proliferation of mobile devices, more and more customers are turning to mobile applications and online platforms to make transfers, check balances, pay bills, and perform other transactions (Hossain et al., 2020).

Despite this trend toward digitization, certain preferences for human contact and personalized advice persist among Colombian financial consumers, such as in the case of the elderly segment, which is becoming increasingly important due to the investment in the population pyramid, not only regionally but also globally (López-Rodríguez et al., 2024). This duality in the preferences of these customers presents a challenge for banking institutions, which must balance digital service offers with personalized attention (Martínez Jiménez, 2021).

For this reason, the acceptance and use of technology by the consumer in the Colombian banking sector needs to be analyzed.

UTAUT was proposed by Venkatesh et al. (2003) to integrate various prominent technology adoption theories. These include the Technology Acceptance Model (Davis, 1989), the Extended Technology Acceptance Model (Venkatesh & Davis, 2000), the Revised Technology Acceptance Model (Venkatesh & Bala, 2008), and the Socio-Cognitive Technology Acceptance Model (Thompson et al., 1994), among others.

The idea of the UTAUT theory is to explain and predict the acceptance and use behavior of technology in various contexts (Venkatesh et al., 2016). It consists of four key factors: performance expectancy, effort expectancy, social influence, and facilitating conditions. Additionally, it includes four moderating factors: age, gender, experience, and voluntariness, which are related to predicting the behavioral intention to use technology and actual technology use, mainly in organizational contexts (Venkatesh et al., 2016).

Performance expectancy, as defined by Fernández Morales et al. (2015), refers to the level of benefit that users believe that they will reap from using an information system. According to Puspitasari et al. (2019), it also corresponds the degree to which using certain types of technology offer benefits when certain activities are carried out, based on the perception of how the technology will perform with a probabilistic and subjective estimation, involving associating a specific action or performance with one or more outcomes (Yu et al., 2021). In this regard, it is proposed that:

> **H1:** Performance expectancy predicts users' behavioral intention and actual use of technology in the Colombian banking sector.

Effort expectancy represents the subjective and probabilistic relationship between one`s effort and the likelihood of one`s successfully performing an action or task (Maillet et al., 2015). According to Morales et al. (2015), it is also elated to the usability of a particular system. This component supports the consumer's perception regarding how easy or difficult it is to use technology in consumption processes, or to learn how to use it, which, in turn, impacts a user's intentions (Puspitasari et al., 2019). Based on the above, it is proposed that:

> **H2:** Effort expectancy predicts users' behavioral intention and actual use of technology in the Colombian banking sector.

For Maillet et al. (2015), social influence is used to measure the impact of perceived influence from a user's social circle, whether it be friends or family, on the use of technology. According to Fernández Morales et al. (2015), it is also referred to the extent to which an individual perceives the use of an information system as important to those around him/her. It is one's ability to develop or change one's mind, feelings, attitudes or behavior because of interaction with others that is perceived as being similar (Yu et al., 2021). Therefore, it is proposed that:

> **H3:** Social influence predicts users' behavioral intention and actual use of technology in the Colombian banking sector.

Facilitating conditions represent consumers perceptions of available resources and customer to carry out the actions they wish to perform, focusing on access to the resources they need to use new technology (Al-Mamary, 2022). Puspitasari et al. (2019) have indicated that these are supportive criteria reflecting the extent to which an individual perceives that the organization is being able to handle new technology. They can be considered objective factors

that allow consumers to perform the tasks that they need (Almogren, 2022). In this regard, it is proposed that:

H4: Facilitating conditions predict users' behavioral intention and actual use of technology in the Colombian banking sector.

Behavioral intention to use is a key component that represents the willingness of users to incorporate technology into their consumption processes, so it is a fundamental predictor of actual use of technology behavior (Chao, 2019); therefore, the higher the intention to use technology, the greater the likelihood that it will be coupled and used Venkatesh et al., 2016).

It is pertinent to highlight that while usage intention predicts users' initial willingness to adopt technology, actual usage reflects the practical and sustained implementation of technology in their daily lives (Chao, 2019); hence, actual use o technology refers to when, in real situations, they have adopted it in their consumption processes (Williams et al., 2015), making it a measure of effective and continuous technology use in their everyday lives (Arfi et al., 2021).

The relationship between behavioral intention and consumers' actual use of technology is a phenomenon that has been studied in various fields, including psychology, sociology, and marketing. It refers to the disparity between what people say they will do or think they will do regarding the coupled and use of a type of technology, and what they do (Chan et al., 2023; Leesakul et al., 2022). This is known as perceived complexity, which emerges when they intend to use a new kind of technology then ultimately perceive it to be too complex to use (Chung & Liang, 2020).

Another aspect related to behavioral intention and actual use of technology is framed within barriers of resistance to technological innovation (Laukkanen, 2016). The challenges of technology acceptance which the banking sector seeks to overcome are greater integration of advanced technology and a deeper understanding of the psychological and functional factors that convince consumers to adopt it (Chaouali & Souiden, 2019). While functional barriers are represented by various obstacles that may hinder the use of new technology by individuals in consumption processes (Antioco & Kleijnen, 2010), psychological barriers refer to cognitive and motivational processes that prevent specific action or behavior modification from occurring (Bercht, 2019).

Taking the above into account, Figure 1 presents the theoretical model addressed in this research.

Figure 1. Proposed theoretical model
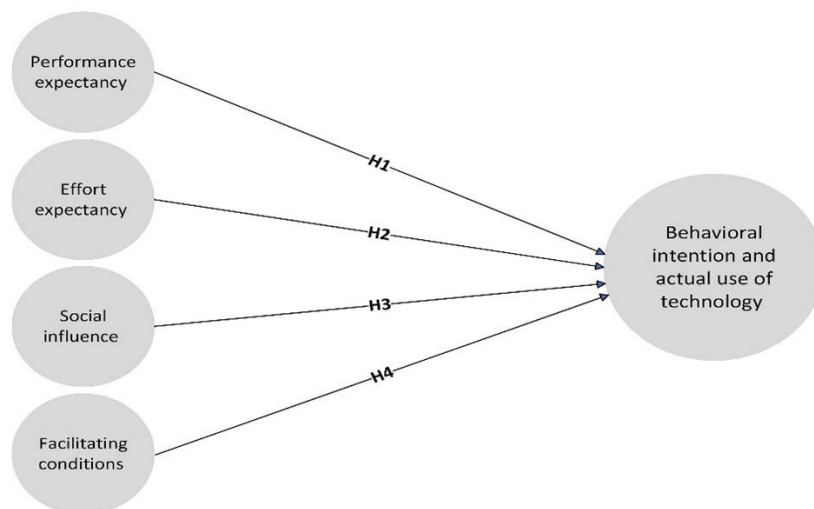
3. MATERIALS AND METHODS

This body of research has been consolidated through an empirical study that adopted a quantitative, descriptive, and causal approach. To achieve the study objectives, an exploratory factor analysis (EFA) and a confirmatory factor analysis (CFA) were used, later complemented with a Structural Equation Modeling (SEM) framework, following the recommendations of Hair et al. (2021).

3.1. The participants

The study involved 556 financial consumers and virtual banking users in Colombia aged between 18 and 65 (M = 35.01; SD = 11.38). Of these, 52.9% were men and 47.1% were women. Non-probabilistic convenience sampling was used, resulting in 497 effective surveys. The instrument was applied anonymously, with participants being informed about the research objectives, confidentiality of information, non-remuneration for their participation and adherence to bioethical principles, which formed the first component of the survey and which was provided to participants in digital format. The fieldwork was conducted in the city of Bogotá, the capital of Colombia, between November and December 2023.

3.2. The instrument

The instrument used was divided into three parts: the first part consisted of informed consent; the second presented 5 items that allowed for the demographic characterization of the participants; the other part located the elements associated with the UTAUT that have been decisive for the analysis of consumer behavior in the banking sector, as proposed by Venkatesh et al. (2003). These elements are facilitating conditions, performance expectancy, effort expectancy, and social influence. In addition, this section explains how the intention of behavioral conduct and the actual use of technology was measured. All the constructs were measured with observed variables with a 5-point Likert scale, with 1 being "totally disagree" and 5 "totally agree".

The applied instrument obtained an overall Cronbach's Alpha of α=0.935, the validation of the theoretical constructs being shown in Table 1. This internal consistency indicates that the items of the instrument were consistently and reliably correlated with each other, generating relevant implications for the quality and interpretation of EFA, CFA, and SEM, which are less likely to be affected by random errors.

Table 1. Internal consistency of the instrument applied.

Theoretical Construct	Cronbach's Alpha	Cronbach's Alpha from standardized elements	Number of items
Performance expectancy (PE)	0.912	0.914	5
Effort expectancy (EE)	0.884	0.887	5
Social influence (SI)	0.702	0.704	4
Facilitating conditions (FC)	0.879	0.881	4
Behavioral intention (BI)	0.708	0.710	4
Actual use of technology (AUT)	0.772	0.776	7

3.3. Procedure and data analysis

To provide psychometric support for the instrument, an exploratory factor analysis (EFA) followed by a confirmatory factor analysis (CFA) was conducted. In the EFA, the Kaiser-Meyer-Olkin (KMO) test was used to assess the adequacy of the data for factor analysis. Subsequently, Bartlett's test of sphericity was performed to determine if there was a significant correlation structure among the variables studied. The extraction method used was principal axis factoring, with a Varimax rotation, in order to obtain a solution of correlated factors and identifying structures for the set of observed variables and group them into latent factors (Grieder & Steiner, 2022).

For the CFA, the maximum likelihood (ML) method was employed due to the ordinal nature of the items on the measurement scale (Chen et al., 2015). The model fit was evaluated using the chi-square test (χ^2), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR), where values below 0.05 indicated a good fit, and values between 0.05 and 0.08 referred to an acceptable fit (Li, 2016). Additionally, the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) were considered, with values above 0.95 indicating a good fit (Li, 2016).

The Omega coefficient (ω) and the Alpha coefficient (α) were reviewed to assess the internal consistency of the scale and were deemed adequate, as they were above 0.80 (Hayes & Coutts, 2020). The average variance extracted (AVE), which represents the average amount of variation that a latent construct can explain in the observed variables to which it is theoretically related, was calculated. This indicator should be greater than 0.50 (Dos Santos & Cirillo, 2023). The KMO test was presented for each item, which allowed the adequacy of the sample to be analyzed that supported the relevance of the factorial analysis conducted, with values close to 1.0, indicating that a factorial analysis may have been useful with the data available (Chen et al., 2015).

Subsequently, a SEM model was developed using the ML estimation method, which produces estimators that are asymptotically efficient, meaning that they have minimal variances in large samples (Maydeu-Olivares, 2017), the development of this analysis of the information was conducted using the open-source software JASP, which is characterized by implementing methods such as frequentist statistical analysis, Bayesian analysis, and regression analysis (Huth et al., 2023).

4. RESULTS

To identify the underlying structure of the variables in the instrument used in the study, an EFA was conducted, including both the dependent variables (BI, ATU) and the independent variables (PE, EE, SI, FC), so that each factor could be revealed separately. Bartlett's test was analyzed, which was observed to be statistically significant (χ^2 = 2783.254, p < 0.001), allowing for the consideration of factorial extraction. The KMO test was performed to whether the total sample was suitable enough to support the relevance of this analysis, yielding a value of 0.922, as shown in Table 2.

Table 2. The KMO and Barlett's test

KMO measure of sampling adequacy		0.922
Bartlett's test of sphericity	Aprox. chi-squared	2783.254
	df	190.000
	p	<0.001

Regarding the RMSEA, which explains the amount of unexplained variance, a value of 0.071 was obtained, indicating a good fit for the data. The TLI, which compares the fit of the proposed model to a null model in degrees of freedom, reached a value of 0.921, identifying a very good fit for it. As for the CFI, which evaluates the goodness of fit of a model to the observed data, the result was 0.965, determining an excellent fit of the model.

Based on the solution provided by the EFA, which utilized principal axis factoring with a Varimax rotation, five latent factors were revealed, explaining 65.7% of the cumulative variance. This finding suggests a complex yet significant underlying structure in the data, providing a solid foundation for the relationships between dependent and independent variables to be better understood.

A combination of the two dependent variables was included, resulting in an initial factor termed "behavioral intention and actual use of technology (BIA)," which accounted for 19.2% of the explained variance, comprising six items. This factor focuses on behavioral intention and actual use of technology.

Regarding the independent variables, PE was the second factor, explaining 16.7% of the variance, composed of four items. The third factor, FC, accounted for 10.9% of the variance, comprising four items. EE was the fourth factor, justifying 9.1% of the variance, with three items. Finally, the fifth factor, SI, attributed 8.2% of the variance and consisted of three items. The factor loadings of the five emerging latent factors are presented in Table 3

Table 3. Factor loadings

Items	BIA	PE	FC	EE	SI
BI3	0.718				
BI4	0.687				
AUT4	0.681				
AUT2	0.655				
AUT1	0.591				
AUT3	0.558				
PE1		0.823			
PE2		0.739			
PE4		0.669			
PE3		0.644			
FC3			0.755		
FC2			0.650		
FC1			0.621		

Items	BIA	PE	FC	EE	SI
FC4			0.589		
EE5				0.820	
EE4				0.623	
EE3				0.577	
SI3					0.732
SI1					0.632
SI4					0.536

To support the results obtained in the EFA, a CFA was conducted. This was done to address its weaknesses (Thompson, 2004) and maintain the phases of structural model construction (Escobedo et al., 2016). The maximum likelihood factorial method (ML) was employed, which allows for estimating the model parameters in such a way as to maximize the probability of observing the actual data based on those parameters. (Liang & Luo, 2020).

Table 4 presents the overall fit indices of the CFA, allowing the fit of the proposed model with the observed data to be evaluated and its underlying structure to be better understood, with a favorable outcome found in this study. The results indicate that the observed factors of the test confirmed the theoretical factorial structure, which subsequently enabled the development of the structural model.

Table 4. General adjustment report

Indicator	CFA adjustments
Chi-square test (χ^2) Baseline model	2098.585
Chi-square test (χ^2) Factor model	163.940
CFI	0.965
TLI	0.955
RMSEA	0.048
SRMR	0.041
RMSEA 90% CI lower bound	0.044
RMSEA 90% CI upper bound	0.075

The data from the latent variables and their respective items showed a general Omega Coefficient (ω) of 0.936, and an Alpha Coefficient (α) of 0.930. Table 5 presents the same indicators independently for each of the resulting latent variables from the EFA, along with the unstandardized factor loadings for each item, the KMO test, and the standard error, revealing satisfactory results for each subscale.

Table 5. Latent factors, reliability, mean variance extracted and item description.

| Latent factors	Omega (ω)	Alpha (α)	AVE	Items	Factor loadings	KMO	p	Sth.Error
BIA	0.858	0.859	0.605	BI4	0.865	0.912	<0.001	0.46
				AUT2	0.770	0.929	<0.001	0.048
				AUT1	0.837	0.951	<0.001	0.044
				AUT4	0.864	0.928	<0.001	0.046
PE	0.898	0.887	0.738	PE1	1.094	0.850	<0.001	0.037
				PE2	0.959	0.851	<0.001	0.046
				PE3	0.883	0.962	<0.001	0.043
FC	0.885	0.879	0.652	FC3	0.891	0.878	<0.001	0.045
				FC1	0.997	0.890	<0.001	0.032
				FC2	0.916	0.923	<0.001	0.040
				FC4	0.794	0.961	<0.001	0.049
EE	0.817	0.796	0.586	EE5	0.923	0.868	<0.001	0.038
				EE4	0.901	0.882	<0.001	0.041
				EE3	0.722	0.944	<0.001	0.056
SI	0.646	0.631	0.501	SI1	0.632	0.841	<0.001	0.075
				SI4	0.887	0.882	<0.001	0.044

For the final stage of the study, and to construct and evaluate the structural model, the ML estimation method was used. The first element considered for the model fit to be evaluated was the chi-square to degrees of freedom ratio (χ^2/df) where the following results were obtained: χ^2 (163.940) / df (94) = 1.74, meeting the parameters proposed by Escobedo et al. (2015), who stated that values below 3 are considered acceptable. Table 6 presents other fit indices for the proposed structural model to be analyzed, which were favorable for the empirical exercise, while Figure 2 displays the structural model of the UTAUT Theory in users' behavioral intention and actual use of technology in the Colombian banking sector.

Table 6. Fit indices for the evaluation of the proposed structural model.

CFI	0.965
TLI	0.955
Bentler-Bonett Non-normed Fit Index (NNFI)	0.955
Bentler-Bonett Normed Fit Index (NFI)	0.954
Bollen's Incremental Fit Index (IFI)	0.965
Relative Noncentrality Index (RNI)	0.965

Source: Own elaboration

Figure 2. Structural model of the UTAUT theory in users' behavioral intention and actual use of technology in the Colombian banking sector.
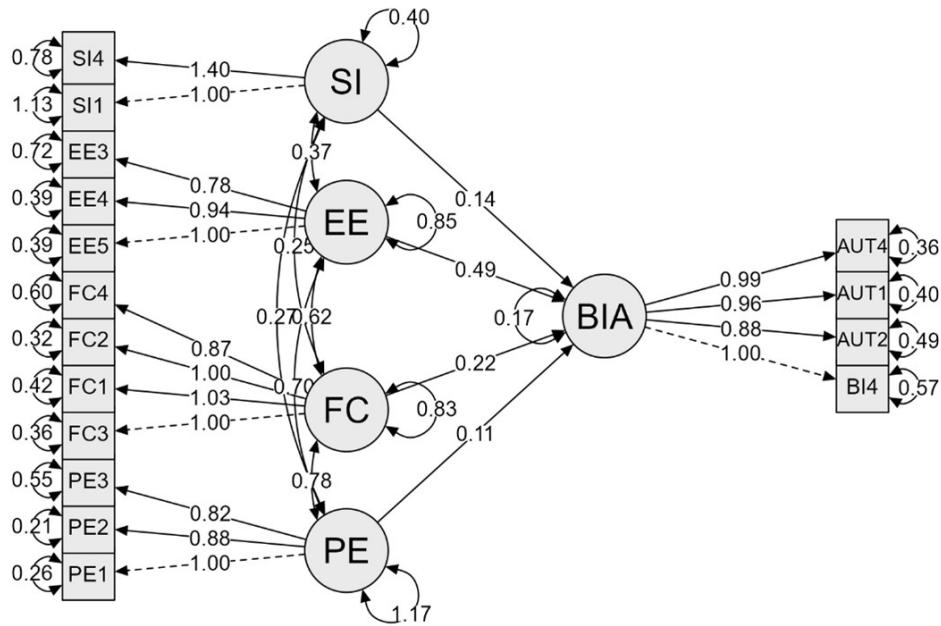
The integration of "behavioral intention" and "actual use of technology" as a specific construct (dependent variable) in this research implies having a grasp of the dynamic relationship between consumers' willingness to adopt the technology and their actual behavior when interacting with it in relation with products in the Colombian banking sector. This relationship is fundamental for understanding the technology adoption process and provides valuable information for designing effective implementation and promotion strategies for technology in the banking sector.

Table 7 presents the hypothesis test, where two out of the four proposals were accepted. Regarding H1 and H3, it was inferred that performance expectancy and social influence did not predict users' behavioral intention and actual use of technology in the Colombian banking sector and were, therefore, rejected. H2 and H4 were accepted because effort expectancy and facilitating conditions did predict them.

Table 7. Hypothesis testing

	Hypothesis	**Standardized regression coefficient**	**Significance (p)**	**Decision**
H1	BIA <--- PE	0.112	0.149	Rejected
H2	BIA <--- EE	0.490	0.001	Accepted
H3	BIA <--- SI	0.142	0.290	Rejected
H4	BIA <--- FC	0.221	0.029	Accepted

5. CONCLUSIONS

The objective of this article was to provide empirical evidence of the relationship between the elements of the UTAUT, with customers' behavioral intention to use technology and their actual use of it in the banking sector. The results showed that both effort expectancy, referring to an individual's perception of the amount of effort required to adopt and use new technology, and facilitating conditions, representing the extent to which consumers perceive that resources exist to facilitate their experience with technology, predict this theory when it comes to banking. However, performance expectancy and social influence as relevant components of UTAUT neither had a significant impact as a predictor on the behavioral intention of consumers to real use technology.

These results have significant implications for the commercial management of banking entities, particularly in terms of strengthening their market orientation. This challenge for contemporary organizations requires the consolidation of integrated marketing, understood as the ability to integrate other management areas into the marketing function, primarily to collectively meet customer expectations. The findings align with previous research indicating that the UTAUT model is suitable for evaluating technology adoption, intention, and consumption in the banking sector (Patil et al., 2020; Samartha et al., 2022), as well as for studying customer satisfaction (Marinković et al., 2020; Bhatt, 2021).

Examining the links between the UTAUT theory and behavioral intention and actual use of technology reaffirms the importance not only of intention in consumer adoption studies in the banking sector but also of usage behavior. This is a distinguishing factor of this research since, unlike most studies that have focused on intention, it emphasizes these two elements as dependent variables, Called Behavioral Intention and Actual Use of Technology," when EFA was applied.

5.1. Theoretical implications of the research

It should be made clear that the UTAUT theory has been validated and applied in various research scenarios, which supports its theoretical relevance. Therefore, its applicability in specific empirical settings allows for research to be conducted that generates solid knowledge about consumer behavior in the banking sector (Al-Mamary, 2022; Arfi et al., 2021; Chao, 2019; Patil et al., 2020; Yu et al., 2021; López-Rodríguez et al., 2024).

It should also be highlighted that the UTAUT theory integrates psychological and social factors, recognizing that the decision to adopt technology is not solely based on individual aspects (Theis et al., 2018). Therefore, components of UTAUT such as performance expectancy and social influence let both personal perceptions and social influences in technology adoption decision-making be considered (Koenig-Lewis et al., 2015).

Mbama and Ezepue (2018) reported that the UTAUT Theory addresses both positive expectations, represented by performance expectancy, and negative ones, standing for effort expectancy, providing a holistic approach to the user experience. This reflects the complexity of consumer behavior and underscores the need to understand both positive and negative perceptions that can affect technology adoption (Chaouali & Souiden, 2019).

The facilitating conditions of the UTAUT theory highlight the importance of the organizational when technology adoption, Gutierrez et al.'s (2015) suggestion which emphasizes the significant role that service providers play in ensuring that end-users receive a proper value proposition that strengthens the consumption of financial and banking services. This implies that consumer behavior is not only determined by individual factors but also by the organizational context that provides resources and support (Shaikh & Karjaluoto, 2015).

UTAUT focuses on initial adoption and even addresses the continuous use of technology, which implies considering temporal dynamics in consumer behavior (Dauda & Lee, 2015). The factors influencing initial consumer intention may differ from those affecting the decision to continue using financial technology over time (Petersen et al., 2015).

5.2. Practical implications of the research

Highlighting the practical implication of this research, the study of the UTAUT Theory in the banking sector not only helps understand behavioral intention and actual use of technology y financial consumers but also provides valuable insights for continuous innovation. Among these, user experience design stands out through the implementation of intuitive interfaces. Understanding the expectation of effort can lead to the creation of user-friendly interfaces in banking applications and platforms, reducing perceived complexity that can enhance technology acceptance.

The development of marketing strategies associated with the existence of tangible benefits influences performance expectancy, which should focus on clearly communicating how technological solutions enhance efficiency, security, and accessibility for customers. These strategies should be complemented with training programs and specific technological development to address consumer perceptions and concerns.

From a social influence management perspective, it is pertinent to promote positive feedback. Such influence plays a significant role in integrated marketing communications. Therefore, activities such as testimonials, reviews, and referral programs can contribute to building a positive perception in the brand community of banking entities.

The facilitating conditions highlight the importance of the organizational environment in enhancing technological infrastructure, not only in business processes but also in administrative activities. This involves providing adequate resources and structuring internal policies that support the adoption and continuous use of financial technologies for the benefit of the consumer.

5.3. Limitations and future research directions

As limitations of the research, it should be highlighted that mediator variables were not used, which could have explained the relationship between the elements of the UTAUT, with bank customers' behavioral intention to use technology and their actual consumption of it. It would be wise to use such mediator variables in future research to holistically recognize the behavior of consumers in your occupation.

Another limitation is the cross-sectional design of the study and its sample size; in light of this, it would be highly recommended for future research to perform experimental longitudinal studies with larger samples, as it would enrich the empirical results and the literature review of consumer behavior in the banking sector.

As future avenues for research, it is suggested to study the UTAUT Theory for different market segments, particularly across different generations, identifying which financial consumer behavior is characteristic of Baby Boomers, Generation X, Millennials, and Generation Z. The physical and psychological features of each of these generations require banking entities to generate, develop, and deliver their value propositions in a customized way. The study of the UTAUT Theory enables companies not only to anticipate consumption trends but also to design strategies that align with the expectations and preferences of each generation, thereby driving long-term success in the market.

Author contributions

Conceptualization, C.E.L. and L.F.R.; Methodology, C.E.L. and L.F.R.; Software, C.E.L.; Validation, C.E.L. and L.F.R.; Formal Analysis, C.E.L.; Data Curation, C.E.L.; Writing - Original Draft Preparation, C.E.L. and L.F.R.; Writing - Review & Editing, C.E.L. All authors have read and agreed to the published version of the manuscript.

References

Alam, S. S., Makmor, N., Masukujjaman, M., Makhbul, Z. K. M., Ali, M. H., & Al Mamun, A. (2023). Integrating the social support theory and technology acceptance model of social commerce websites. *Revista Galega de Economía, 32*(2), 1-24. https://doi.org/10.15304/rge.32.2.8558

Al-Mamary, Y. H. (2022). Understanding the use of learning management systems by undergraduate university students using the UTAUT model: Credible evidence from Saudi Arabia. *International Journal of Information Management Data Insights, 2*(2), 100092. https://doi.org/10.1016/j.jjimei.2022.100092

Almogren, A. S. (2022). Art education lecturers' intention to continue using the blackboard during and after the COVID-19 pandemic: An empirical investigation into the UTAUT and TAM model. *Frontiers in Psychology, 13*, 944335. https://doi.org/10.3389/fpsyg.2022.944335

Antioco, M. & Kleijnen, M. (2010). Consumer adoption of technological innovations: Effects of psychological and functional barriers in a lack of content versus a presence of content situation. *European Journal of Marketing, 44*(11/12), 1700-1724. https://doi.org/10.1108/03090561011079846

Arfi, W. B., Nasr, I. B., Kondrateva, G., & Hikkerova, L. (2021). The role of trust in intention to use the IoT in eHealth: Application of the modified UTAUT in a consumer context. *Technological Forecasting and Social Change, 167*, 120688. https://doi.org/10.1016/j.techfore.2021.120688

Bercht, A. L. (2019). Sleepwalking into disaster? Understanding coping in the broader field of mental barriers. Examples from the Norwegian Arctic in the face of climate change. *Disaster Research and the Second Environmental Crisis: Assessing the Challenges Ahead*, 137-160. https://doi.org/10.1007/978-3-030-04691-0_7

Bhatt, V. (2021). An empirical study to evaluate factors affecting customer satisfaction on the adoption of Mobile Banking Track: Financial Management. *Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12*(10), 5354-5373. https://doi.org/10.17762/turcomat.v12i10.5338

Calvo Dopico, D., del Castillo Puente, Á. M., & Arias Montero, S. R. (2021). Marketing strategies of global and local brands in developing economies: a comparative study in the Ecuadorian chocolate market. *Revista Galega de Economía, 30*(4), 1-19. https://doi.org/10.15304/rge.30.4.7824

Camoiras-Rodríguez, Z., & Varela-Neira, C. (2020). Mobile commerce purchase behaviour: The importance of personality traits. *Revista Galega de Economía, 29*(3), 1-22. https://doi.org/10.15304/rge.29.3.6787

Chan, C. K. Y., & Lee, K. K. (2023). The AI generation gap: Are Gen Z students more interested in adopting generative AI such as ChatGPT in teaching and learning than their Gen X and

millennial generation teachers? *Smart Learning Environments, 10*(1), 60. https://doi.org/10.1186/s40561-023-00269-3

Chao, C. M. (2019). Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. *Frontiers in psychology, 10*, 1652. https://doi.org/10.3389/fpsyg.2019.01652

Chaouali, W. & Souiden, N. (2019). The role of cognitive age in explaining mobile banking resistance among elderly people. *Journal of Retailing and Consumer Services, 50*, 342-350. https://doi.org/10.1016/j.jretconser.2018.07.009

Chen, P. Y., Yang, C. M., & Morin, C. M. (2015). Validating the cross-cultural factor structure and invariance property of the Insomnia Severity Index: evidence based on ordinal EFA and CFA. *Sleep medicine, 16*(5), 598-603. https://doi.org/10.1016/j.sleep.2014.11.016

Chung, K. C., & Liang, S. W. J. (2020). Understanding factors affecting innovation resistance of mobile payments in Taiwan: An integrative perspective. *Mathematics, 8*(10), 1841. https://doi.org/10.3390/math8101841

Cichosz, M., Wallenburg, C. M., & Knemeyer, A. M. (2020). Digital transformation at logistics service providers: barriers, success factors and leading practices. *The International Journal of Logistics Management, 31*(2), 209-238. https://doi.org/10.1108/IJLM-08-2019-0229

Dauda, S. Y., & Lee, J. (2015). Technology adoption: A conjoint analysis of consumers' preference on future online banking services. *Information Systems, 53*, 1-15. https://doi.org/10.1016/j.is.2015.04.006

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-340. https://doi.org/10.2307/249008

Dos Santos, P. M., & Cirillo, M. Â. (2023). Construction of the average variance extracted index for construct validation in structural equation models with adaptive regressions. *Communications in Statistics-Simulation and Computation, 52*(4), 1639-1650. https://doi.org/10.1080/03610918.2021.1888122

Escobedo P. M. T., Hernández G. J. A., Estebané Ortega, V. y Martínez Moreno, G. (2016). Modelos de ecuaciones estructurales: características, fases, construcción, aplicación y resultados. *Ciencia & trabajo, 18*(55), 16-22. http://dx.doi.org/10.4067/S0718-24492016000100004

Filotto, U., Caratelli, M., & Fornezza, F. (2021). Shaping the digital transformation of the retail banking industry. Empirical evidence from Italy. *European Management Journal, 39*(3), 366-375. https://doi.org/10.1016/j.emj.2020.08.004

González Núñez, J. C., & Mariné Osorio, F. J. (2021). An econometric analysis of private insurance in the urban and rural population in Mexico. *Revista Galega de Economía, 30*(4), 1-19. https://doi.org/10.15304/rge.30.4.7682

Grieder, S. & Steiner, M. D. (2022). Algorithmic jingle jungle: A comparison of implementations of principal axis factoring and promax rotation in R and SPSS. *Behavior research methods, 54*(1), 54-74. https://doi.org/10.3758/s13428-021-01581-x

Gutierrez, A., Boukrami, E., & Lumsden, R. (2015). Technological, organisational and environmental factors influencing managers' decision to adopt cloud computing in the UK. *Journal of enterprise information management, 28*(6), 788-807.

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*. Springer Nature https://doi.org/10.1007/978-3-030-80519-7

Hayes, A. F. & Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating reliability. But... *Communication Methods and Measures, 14*(1), 1-24. https://doi.org/10.1080/19312458.2020.1718629

Hossain, S. F. A., Xi, Z., Nurunnabi, M., & Hussain, K. (2020). Ubiquitous role of social networking in driving M-Commerce: evaluating the use of mobile phones for online shopping and payment in the context of trust. *Sage Open, 10*(3), https://doi.org/10.1177/2158244020939536

Huth, K. B., de Ron, J., Goudriaan, A. E., Luigjes, J., Mohammadi, R., van Holst, R. J., ... & Marsman, M. (2023). Bayesian analysis of cross-sectional networks: A tutorial in R and JASP. *Advances in Methods and Practices in Psychological Science, 6*(4), 251-264. https://doi.org/10.1177/2515245923119333

Kaur, S. J., Ali, L., Hassan, M. K., & Al-Emran, M. (2021). Adoption of digital banking channels in an emerging economy: exploring the role of in-branch efforts. *Journal of Financial Services Marketing, 26*, 107-121. https://doi.org/10.1057/s41264-020-00082-w

Khanra, S., Dhir, A., Kaur, P., & Joseph, R. P. (2021). Factors influencing the adoption postponement of mobile payment services in the hospitality sector during a pandemic. *Journal of Hospitality and Tourism Management, 46*, 26-39. https://doi.org/10.1016/j.jhtm.2020.11.004

Kitsios, F., Giatsidis, I., & Kamariotou, M. (2021). Digital transformation and strategy in the banking sector: Evaluating the acceptance rate of e-services. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(3), 204. https://doi.org/10.3390/joitmc7030204

Koenig-Lewis, N., Marquet, M., Palmer, A., & Zhao, A. L. (2015). Enjoyment and social influence: predicting mobile payment adoption. *The Service Industries Journal, 35*(10), 537-554. https://doi.org/10.1080/02642069.2015.1043278

Laukkanen, T. (2016). Consumer adoption versus rejection decisions in seemingly similar service innovations: The case of the Internet and mobile banking. *Journal of Business Research, 69*(7), 2432-2439. https://doi.org/10.1016/j.jbusres.2016.01.013

Leesakul, N., Oostveen, A. M., Eimontaite, I., Wilson, M. L., & Hyde, R. (2022). Workplace 4.0: Exploring the implications of technology adoption in digital manufacturing on a sustainable workforce. *Sustainability, 14*(6), 3311. https://doi.org/10.3390/su14063311

Li, C. H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior research methods, 48*, 936-949. https://doi.org/10.3758/s13428-015-0619-7

Liang, X., & Luo, Y. (2020). A comprehensive comparison of model selection methods for testing factorial invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 27*(3), 380-395. https://doi.org/10.1080/10705511.2019.1649983

López-Rodríguez, C. E., & Sandoval-Escobar, M. (2023). Dimensions of brand equity for the banking sector: A study in the elderly segment. *Journal of International Studies, 16*(4), 205-219. https://doi.org/10.14254/2071-8330.2023/16-4/14

López-Rodríguez, C. E., & Cardozo-Munar, C. E. (2023). Current global overview of perceptions of mobile banking usage: a bibliometric analysis and systematic literature review. *Universidad y Sociedad, 15*(5), 395-409. https://rus.ucf.edu.cu/index.php/rus/article/view/4086

López-Rodríguez, C. E., & López-Ordoñez, D. A. (2022). Financial education in colombia: challenges from the perception of its population with socioeconomic vulnerability. *Economics & Sociology, 15*(1), 193-204. https://doi.org/10.14254/2071-789X.2022/15-1/12

López-Rodríguez, C. E., Sandoval-Escobar, M., & Sepúlveda Maldonado, J. A. (2024). Resistance to technological innovation and brand equity in the banking sector. *Management & Marketing, 19*(1). https://doi.org/10.2478/mmcks-2024-0006

López-Rodríguez, C. E., Sotelo-Muñoz, J. K., Muñoz-Venegas, I. J., & López-Aguas, N. F. (2024). Análisis de la multidimensionalidad del brand equity para el sector bancario: un estudio en la generación Z. *RETOS. Revista de Ciencias de la Administración y Economía, 14*(27), 9-20. https://doi.org/10.17163/ret.n27.2024.01

Louw, C., & Nieuwenhuizen, C. (2020). Digitalisation strategies in a South African banking context: A consumer services analysis. *South African Journal of Information Management, 22*(1), 1-8. https://sajim.co.za/index.php/SAJIM/article/view/1153

Maillet, É., Mathieu, L., & Sicotte, C. (2015). Modeling factors explaining the acceptance, actual use and satisfaction of nurses using an Electronic Patient Record in acute care settings: An extension of the UTAUT. *International journal of medical informatics, 84*(1), 36-47. https://doi.org/10.1016/j.ijmedinf.2014.09.004

Marinković, V., Đorđević, A., & Kalinić, Z. (2020). The moderating effects of gender on customer satisfaction and continuance intention in mobile commerce: a UTAUT-based perspective. *Technology Analysis & Strategic Management, 32*(3), 306-318. https://doi.org/10.1080/09537325.2019.1655537

Martínez Jiménez, S. A. (2021). Retos del sistema financiero colombiano en la Cuarta Revolución Industrial. *Semestre Económico, 24*(56), 253-270. https://doi.org/10.22395/seec.v24n56a11

Maydeu-Olivares, A. (2017). Maximum likelihood estimation of structural equation models for continuous data: Standard errors and goodness of fit. *Structural Equation Modeling: A Multidisciplinary Journal, 24*(3), 383-394. https://doi.org/10.1080/10705511.2016.1269606

Mbama, C. I., & Ezepue, P. O. (2018). Digital banking, customer experience and bank financial performance: UK customers' perceptions. *International journal of bank marketing, 36*(2), 230-255. https://doi.org/10.1108/IJBM-11-2016-0181

Monroy-Perdomo, L., Cardozo-Munar, C., Torres-Hernández, A., Tena-Galeano, J., & López-Rodríguez, C. E. (2022). Formalization of a new stock trend prediction methodology based on the sector price book value for the Colombian market. *Heliyon*, e09210. https://doi.org/10.1016/j.heliyon.2022.e09210

Morales, K., Casarín, A. V., & Salas, L. M. (2015). Apropiación tecnológica: Una visión desde los modelos y las teorías que la explican. *Perspectiva Educacional, Formación de Profesores, 54*(2), 109-125. https://doi.org/10.4151/07189729

Parida, V., Mostaghel, R. & Oghazi, P. (2016). Factors for elderly use of social media for health-related activities. *Psychology and Marketing, 33*(12), 1134-1141. https://doi.org/10.1002/mar.20949

Patil, P., Tamilmani, K., Rana, N. P., & Raghavan, V. (2020). Understanding consumer adoption of mobile payment in India: Extending Meta-UTAUT model with personal innovativeness,

anxiety, trust, and grievance redressal. *International Journal of Information Management, 54*, 102144. https://doi.org/10.1016/j.ijinfomgt.2020.102144

Petersen, J. A., Kushwaha, T., & Kumar, V. (2015). Marketing communication strategies and consumer financial decision making: The role of national culture. *Journal of marketing, 79*(1), 44-63. https://doi.org/10.1509/jm.13.0479

Puspitasari, N., Firdaus, M. B., Haris, C. A., & Setyadi, H. J. (2019). An application of the UTAUT model for analysis of adoption of integrated license service information system. *Procedia Computer Science, 161*, 57-65. https://doi.org/10.1016/j.procs.2019.11.099

Samartha, V., Shenoy Basthikar, S., Hawaldar, I. T., Spulbar, C., Birau, R., & Filip, R. D. (2022). A study on the acceptance of mobile-banking applications in India—unified theory of acceptance and sustainable use of technology model (UTAUT). *Sustainability, 14*(21), 14506. https://doi.org/10.3390/su142114506

Shaikh, A. A., & Karjaluoto, H. (2015). Mobile banking adoption: A literature review. *Telematics and informatics, 32*(1), 129-142. https://doi.org/10.1016/j.tele.2014.05.003

Schulze, A., Townsend, J. D., & Talay, M. B. (2022). Completing the market orientation matrix: The impact of proactive competitor orientation on innovation and firm performance. *Industrial Marketing Management, 103*, 198-214. https://doi.org/10.1016/j.indmarman.2022.03.013

Theis, S., Lefore, N., Meinzen-Dick, R., & Bryan, E. (2018). What happens after technology adoption? Gendered aspects of small-scale irrigation technologies in Ethiopia, Ghana, and Tanzania. *Agriculture and human values, 35*, 671-684. https://doi.org/10.1007/s10460-018-9862-8

Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications*. American Psychological Association. https://doi.org/10.1037/10694-000

Thompson, R. L., Higgins, C. A., & Howell, J. M. (1994). Influence of experience on personal computer utilization: Testing a conceptual model. *Journal of management information systems, 11*(1), 167-187. https://doi.org/10.1080/07421222.1994.11518035

Tsindeliani, I. A., Proshunin, M. M., Sadovskaya, T. D., Popkova, Z. G., Davydova, M. A., & Babayan, O. A. (2022). Digital transformation of the banking system in the context of sustainable development. *Journal of Money Laundering Control, 25*(1), 165-180. https://doi.org/10.1108/JMLC-02-2021-0011

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science, 46*(2), 186-204.

Venkatesh, V., Morris, M., Davis, G. & Davis, F. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly, 27*(3), 703–708. https://doi.org/10.2307/30036540

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision sciences, 39*(2), 273-315. https://doi.org/10.1111/j.1540-5915.2008.00192.x

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the Association for Information Systems, 17*(5), 328–376. https://doi.org/10.17705/1jais.00428

Williams, M. D., Rana, N. P., & Dwivedi, Y. K. (2015). The unified theory of acceptance and use of technology (UTAUT): a literature review. *Journal of enterprise information management, 28*(3), 443-488. https://doi.org/10.1108/JEIM-09-2014-0088

Yu, L., Chen, Z., Yao, P., & Liu, H. (2021). A study on the factors influencing users' online knowledge paying-behavior based on the UTAUT model. *Journal of theoretical and applied electronic commerce research, 16*(5), 1768-1790. https://doi.org/10.3390/jtaer16050099

Appendix

Theoretical construct and instrument items

Theoretical Construct	Items
Performance expectancy	• What motivates me the most to use online banking is the ease and convenience of conducting banking transactions. • Using online banking increases the possibility of conducting transactions at any time and from anywhere. • The use of banking technology enhances the quality of service provided by financial institutions. • Using technology makes it easier and more effective to conduct financial transactions on a mobile phone or a computer. • I do not feel insecure or unconfident when performing online banking transactions.
Effort expectancy	• Learning to use online banking was easy. • I like finding banking technology that is easy to use. • I consider a computer to be the easiest device for conducting financial transactions. • I consider a mobile phone to be the easiest device for conducting financial transactions. • I consider myself more than to use banking technology.
Social influence	• The opinion of my family or peers influences the use of online banking. • In my workplace, the use of banking technology is supported. • In my workplace, staff members who use online banking have more prestige than those who do not. • The members of my family who use online banking have a higher status.
Facilitating conditions	• I use online banking whenever I can. • I have the necessary technological resources to use online banking. • I have the necessary knowledge to use the latest online banking tolos. • When I encounter difficulties with online banking, my bank offers me technical support.
Behavioral intention	• I use online banking due to my work and social routines. • I conduct more transactions via online banking than in a physical bank branch. • I intend to continue using online banking in the future because of the benefits it provides me with. • To carry out my job role, the use of online banking is important.
Actual use of technology	• I use technology to improve my quality of life. • Using online banking has become a regular part of my routine. • I frequently use digital wallets to conduct virtual financial transactions.

Theoretical Construct	Items
	• I am frightened, nervous or apprehensive of new technology because I don't feel that I am prepared or skilled enough to use it. • I am frightened to use new technology due to the fear of the unknown. • Using online banking is fun and enjoyable. • I feel frustrated by the inability to use technology to conduct banking transactions.