

-RESEARCH ARTICLE-

BANKING IN THE PALM OF THE HAND: EASE OF USE, TRUST, AND THE SUSTAINABILITY OF MOBILE FINANCIAL SERVICES IN IRAQ

Huda M. Saleem Muhi Al-Sahrawardee

Department of Banking and Financial Sciences, Mustansiriyah
University, Baghdad, Iraq

ORCID: <https://orcid.org/0000-0003-1156-7785>

Email: Alsahrawardee_huda@uomustansiriya.edu.iq

Fadila Ali Chaichan

Department of Banking and Financial Sciences, Mustansiriyah
University, Baghdad, Iraq

ORCID: <https://orcid.org/0000-0003-1751-2486>

Email: fathala@uomustansiriya.edu.iq

—Abstract—

This study investigates mobile banking in Iraq as an increasingly important banking channel, particularly among younger customers who are attracted by its potential to reduce both transaction time and associated costs. Against this background, the study considers whether the growing use of mobile banking is supported by the two fundamental capabilities required for sustainable digital banking, namely usability and trust. More specifically, it evaluates the capacity and effectiveness of technological applications to support sustainable banking practices within the Iraqi banking sector. Data were collected through an electronic questionnaire from a purposively selected group of 130 customers using mobile banking services provided by Iraqi public and private banks. The instrument assessed six indicators relating to ease of use and five indicators concerning trust and security, with responses recorded using a five-point Likert scale. The reliability analysis demonstrated satisfactory internal consistency, as indicated by a Cronbach's alpha value of 0.864. One-sample t-tests were subsequently employed to determine whether the observed responses for each dimension differed from the neutral midpoint. Although both dimensions showed statistically significant departures from neutrality, the analysis at item level identified a clear divergence in

Citation (APA): Al-Sahrawardee, H. M. S. M., Chaichan, F. A. (2026). Banking in the Palm of the Hand: Ease of Use, Trust, and the Sustainability of Mobile Financial Services in Iraq. *International Journal of Economics and Finance Studies*, 18(03), 205-229. doi: 10.34109/ijefs.2026180310

customer perceptions. Respondents viewed the convenience associated with routine transactions favourably, whereas perceptions concerning fund transfers, account inspection, and legal protection remained below the scale midpoint. In light of these findings, the study recommends that Iraqi banks continuously adapt to technological developments in mobile banking to support the long-term sustainability of their operations. Greater adoption of such services may contribute to broader financial inclusion and the advancement of sustainable banking. At the same time, banks should place greater emphasis on building customer confidence by reinforcing data confidentiality, information security, and the protection of customers' personal and financial information.

Keywords: Mobile Banking; Financial Services; Ease of Use; Trust and Security; Banking Sustainability; Financial Inclusion; Iraq.

INTRODUCTION

Banks continually seek to introduce innovations that simplify financial dealings, reduce transaction costs, and enable customers to complete banking activities rapidly at any time of the day. By reducing the need to visit physical branches, such developments can also minimise waiting periods and lengthy queues. The expansion of mobile banking has emerged from this objective, allowing customers to undertake a wide range of banking activities directly through their mobile devices. These services provide users with greater autonomy over their accounts, including access to account information, balance and expenditure monitoring, bill settlement, fund transfers between personal and third-party accounts, ticket payments, hotel reservations, loan and advance applications, personal investment of deposited funds, and access to other financial facilities. Consequently, mobile banking has progressed beyond its earlier role as a supplementary service and has increasingly become the principal interface through which many customers engage with the financial system ([Alsmadi et al., 2022](#)).

Mobile banking has consequently transformed conventional financial and commercial practices by enabling transactions to be completed rapidly without requiring customers to attend a branch. This immediacy allows individuals to manage and deploy their funds when required, avoiding delays associated with traditional banking procedures. Nevertheless, the technological advantages of phone-based banking are accompanied by security vulnerabilities and operational concerns. The loss or theft of a mobile device represents a particularly significant risk because unauthorised access may expose sensitive financial and personal information. Customers must therefore maintain strict control over their devices, protect their authentication credentials, and avoid permitting other individuals to access or operate their phones. The same technological characteristics that make mobile banking attractive therefore produce a duality that is central to this study: the channel offers substantial convenience while simultaneously creating concerns regarding security, privacy, and exposure to risk.

Evidence from the international literature indicates that the availability of mobile banking infrastructure does not, by itself, guarantee customer adoption or continued use. Syntheses covering approximately two decades of research identify perceived usefulness, perceived ease of use, social influence, trust, and perceived risk as interconnected determinants of mobile banking behaviour (Alsmadi et al., 2022; Kumar et al., 2023). Research drawing on extensions of the unified theory of acceptance and use of technology further demonstrates that security, privacy, and trust contribute additional explanatory value beyond the conventional technology-acceptance variables (Merhi et al., 2019). Evidence based on actual usage behaviour, rather than merely stated intentions, similarly indicates that trust and service-quality attributes influence whether customers who have adopted a mobile banking application ultimately use it for financial transactions (Baabdullah et al., 2019). Thus, convenience by itself cannot secure sustained engagement. When customers question the reliability or integrity of a digital banking channel, the perceived benefits associated with convenience are correspondingly weakened (Shankar & Rishi, 2020).

The broader developmental implications of digital banking are also supported by existing research. Digital technologies can promote financial inclusion by reducing the fixed costs associated with serving customers whose transactions are relatively small and by extending financial services to communities for which conventional branch networks are economically impractical (Kouladoun et al., 2022). Empirical evidence from emerging economies indicates that mobile banking can contribute to higher levels of financial inclusion among commercial-bank customers (Saeed & Donkoh, 2024), although research examining branch outreach demonstrates that physical or technological access alone does not necessarily translate into actual usage (Maity & Sahu, 2023). Financial inclusion can subsequently generate benefits for the banking sector itself, having been associated with stronger bank stability in emerging economies (Wang & Luo, 2022) and enhanced profitability (Yakubu & Musah, 2024). Furthermore, financial inclusion can influence the relationship between digital transformation and bank performance by moderating its effects (Yang & Masron, 2023). From this perspective, sustainability within banking should not be regarded simply as an additional reputational objective. Rather, it is closely connected with the banking system's ability to provide durable services to a broad customer base while controlling the costs of delivery.

The Iraqi context provides a particularly relevant setting in which to examine these relationships. Mobile telephone penetration expanded from a very limited level in 2002 to almost universal coverage over the subsequent two decades. At the same time, however, Iraq's banking sector continues to exhibit strong dependence on cash, comparatively low intermediation ratios relative to regional benchmarks, and continued reliance on payment arrangements that leave a considerable proportion of salaried transactions outside formal banking accounts. Iraq therefore exhibits a notable imbalance: the technological foundation required for digital financial transition has

developed substantially among customers, whereas some of the institutional conditions needed to support that transition have progressed more slowly.

This divergence provides an important context for examining whether the relationship between digital technology and financial inclusion identified in international research can operate effectively within the Iraqi banking environment. It also cannot be adequately understood through cross-country evidence alone and requires empirical investigation grounded in the experiences of customers operating within this market. Evidence from comparable regional settings suggests that adoption produces meaningful improvements in customer outcomes only when digital services consistently perform the functions that customers consider valuable (Hamidi & Safareeyeh, 2019). The analytical issue therefore extends beyond the question of whether customers are willing to adopt mobile banking; it concerns whether the channel provides the usability, reliability, security, and functionality upon which continued adoption depends.

Scope of the Study

The investigation is deliberately restricted to the demand-side perspective of Iraq's retail banking sector. Accordingly, it does not incorporate bank-level balance-sheet modelling, quantify the profitability implications of expenditure on digital technologies, or examine the regulatory framework governing electronic payment systems. Instead, the analysis concentrates on customers' perceptions of two capabilities considered fundamental to sustained mobile banking adoption in the relevant literature: the usability of the mobile banking channel and the level of trust and security associated with its use. The former capability is represented by six indicators, whereas the latter is assessed through five indicators. The analysis is conducted among customers of both government and private banks who already use mobile banking services. This sampling approach therefore provides evidence about actual user experiences rather than the prospective intentions of individuals who have not yet adopted the technology. The research employs a single cross-sectional design and is geographically limited to Iraq, where mobile telephone access has expanded dramatically from a very low level in 2002 to almost universal coverage, despite the comparatively slower evolution of conventional banking practices.

The scope is also limited with respect to the supply side of digital banking. The findings reflect customers' perceptions of the services they receive rather than objective assessments of the technological systems, operational processes, or security mechanisms implemented by individual banks. Consequently, perceived service quality and actual system performance may not necessarily correspond. Any comparison between these two dimensions presented in the discussion is therefore conceptual and interpretive rather than based on direct measurement of bank-side performance. Although this reliance on perceptual evidence represents a recognised limitation of

survey-based research into technology adoption, it does not diminish the diagnostic relevance of the findings. Customer perceptions remain particularly important because they directly influence confidence in the channel and, ultimately, the willingness of existing users to continue conducting banking activities through mobile platforms.

Significance of the Study

The importance of this research lies in examining how contemporary technologies can be utilised by financial and banking institutions to deliver innovative services while strengthening customer confidence, security, and the long-term sustainability of banking activities. In addition to this broad rationale, the study offers three distinct contributions. First, at the empirical level, it provides primary evidence from Iraq, a national context that remains comparatively underrepresented in a research field largely informed by evidence from South Asia, Sub-Saharan Africa, and the Gulf region. Iraq provides a particularly demanding setting in which to examine established propositions because its post-conflict banking environment, continued dependence on cash-based transactions, and relatively limited financial intermediation differ substantially from many of the contexts in which existing findings have been developed. Second, the study contributes analytically by separating two dimensions that are often combined and presented through aggregate scores. This approach demonstrates that statistical significance at the construct level can coexist with individual indicators that remain below the neutral benchmark. Such internal variation has practical implications because an overall mean may mask specific weaknesses that require managerial intervention. Third, from a practical perspective, the study pinpoints the particular capabilities that Iraqi banks need to strengthen. By differentiating between functions that customers already regard as satisfactory and those that continue to restrict more extensive engagement, the findings provide a more targeted basis for prioritising improvements in mobile banking services.

Statement of the Problem

The research problem is rooted in the limited body of empirical work examining mobile banking in Iraq, together with relatively weak awareness of contemporary banking services among segments of Iraqi society. This situation is compounded by insufficient trust between customers and banking institutions and by limited appreciation of the contribution that innovative financial services can make to sustainable development. Within this context, the study addresses several interrelated questions. First, it examines whether Iraqi customers are sufficiently aware of innovative banking services, particularly mobile banking. Second, it investigates whether government and private banks in Iraq possess the technical infrastructure and technological capabilities required to deliver such services effectively. Third, it considers whether mobile banking can support sustainable development within the Iraqi banking sector. Finally, it evaluates whether customers perceive mobile banking as sufficiently easy and convenient to use.

Viewed from an analytical perspective, the central problem concerns a mismatch between technological availability and functional capability: although the mobile banking channel has become accessible, it remains uncertain whether the services provided through it offer the level of usability, reliability, and assurance necessary to support sustained customer engagement.

Research Objectives

The study seeks to establish the significance of mobile banking, enhance understanding of its adoption among customers, and clarify how mobile banking services can contribute to sustainable development within the banking sector. To translate these broad aims into measurable outcomes, and consistent with the findings presented in Section 5, the research is structured around four specific objectives. The first objective is to examine the demographic profile of customers who use mobile banking in Iraq, thereby identifying the population segments in which adoption is most evident. The second objective is to assess the extent to which ease-of-use attributes are available within Iraqi banks' mobile banking systems, with each indicator examined separately rather than being reduced to a single aggregate measure. The third objective similarly evaluates the presence of trust and security attributes by considering their individual indicators. The fourth objective is to determine statistically whether the two dimensions differ from the neutral reference point and, based on the resulting indicator-level pattern, establish a prioritised set of areas for improvement that can assist Iraqi banks in developing mobile banking services capable of supporting sustained and sustainable use.

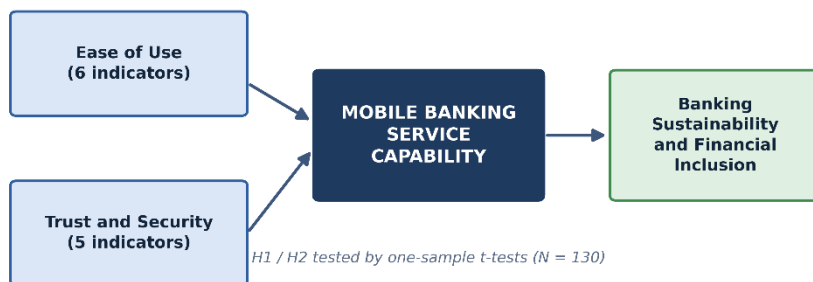


Figure 1: Conceptual Framework Linking Ease of Use and Trust and Security to Mobile Banking Capability and Banking Sustainability

Note: Prepared by the authors. The two exogenous dimensions correspond to Parts One and two of the survey instrument described in Section 4.3.

Two hypotheses follow. The first null hypothesis ($H0_1$) states that there are no statistically significant differences between users' opinions regarding the availability of ease-of-use characteristics of mobile phones in the provision of banking services. The second null hypothesis ($H0_2$) states that there are no statistically significant differences between users' opinions regarding the availability of trust and safety characteristics.

Figure 1 illustrates the conceptual framework developed for the study, depicting the proposed relationship between the two assessed dimensions and the study's outcome of interest.

LITERATURE REVIEW

The Concept of Mobile Banking

Information technology has fundamentally reshaped the delivery of financial services by enabling banks to introduce increasingly sophisticated channels, among which mobile banking has become particularly prominent. In broad terms, mobile banking refers to the provision of banking facilities through a mobile device, enabling customers to access and perform banking activities without being constrained by conventional branch opening hours. It represents an innovative service-delivery mechanism adopted by banks and other financial institutions and forms an important component of electronic banking that extends beyond traditional branch-centred service provision. In practical terms, mobile banking incorporates the technological applications and telephone-based systems through which customers can undertake activities such as deposits, withdrawals, fund transfers, account management, and the retrieval of financial information. Across contemporary definitions, the underlying concept remains consistent: mobile banking involves providing and using banking and financial services through mobile communication technologies, including access to accounts, execution of financial transactions, and retrieval of relevant information (Alsmadi et al., 2022).

Mobile-enabled banking facilities represent an important development in the management of personal accounts and the execution of financial transactions. By introducing self-service digital technologies, banks can provide customers with greater control over routine financial activities while seeking simultaneously to attract new users and strengthen confidence in the institution. It is also important to distinguish mobile banking from mobile payment when considering the scope of these services. Mobile payment primarily relates to the settlement of financial obligations through a mobile device, whereas mobile banking provides access to a considerably wider set of account-related savings, information, and transaction functions. This broader functionality increases the importance of both usability and assurance, since customers must be able to navigate diverse services effectively while also feeling confident that their financial activities and information remain secure (Ho et al., 2020).

Determinants of Adoption and Continued Use

The body of adoption research increasingly relies on an extended acceptance perspective in which conventional determinants, including performance expectancy, effort expectancy, social influence, and facilitating conditions, are complemented by variables capturing the financial risks associated with digital transactions. Using a sample of 253 young Indian users, Kumar et al. (2023) reported that performance

expectancy, effort expectancy, social influence, and perceived financial cost each exerted a significant influence on behavioural intention. Their findings further indicated that perceived risk and trust affected the extent to which intention translated into actual usage. This finding has relevance to the present investigation because it demonstrates that willingness to adopt cannot be treated as sufficient evidence of use. Rather, the conversion of intention into behaviour depends partly on whether customers perceive the digital channel as trustworthy and adequately protected.

Evidence from culturally different markets reinforces the importance of these assurance-related factors. In their comparative investigation of Lebanese and British consumers, [Merhi et al. \(2019\)](#) showed that incorporating security, privacy, and trust into the unified theory of acceptance and use of technology improves its explanatory capacity, although the importance attached to these variables differs across institutional and cultural contexts. Focusing on actual usage among Saudi customers rather than solely on behavioural intention, [Baabdullah et al. \(2019\)](#) found that system quality, information quality, and service quality interact with trust in shaping mobile banking behaviour. Similar evidence was reported for South African millennials by [Thusi and Maduku \(2020\)](#), while [Geebren et al. \(2021\)](#) demonstrated that customer satisfaction with mobile banking depends substantially on trust and system quality, rather than being determined exclusively by the range of functions offered. Cross-national evidence presented by [Ho et al. \(2020\)](#) likewise suggests that although the principal determinants of behavioural intention remain broadly consistent between countries, their relative effects vary according to the institutional setting. This variation indicates that relationships identified in other markets should not be transferred uncritically to Iraq.

Convenience presents a more complex relationship within the adoption literature. [Shankar and Rishi \(2020\)](#) identified convenience as a significant contributor to adoption intention, but also demonstrated that its influence is constrained by perceptions of risk. Consequently, improvements in convenience cannot necessarily offset deficiencies in security or customer assurance. Extending the analysis from initial adoption to continued use, [Franque et al. \(2021\)](#) found through a meta-analysis of continuance intention in information systems that confirmation of prior expectations and perceived usefulness are particularly influential in determining whether users continue with a system. This distinction is important when considering sustainability because the determinants encouraging an individual to try a service for the first time may not be the same as those that sustain subsequent usage. A banking institution may therefore succeed in encouraging customers to install or initially access a mobile application yet fail to achieve durable engagement if the conditions required for continued use are not adequately maintained.

Trust, Security, and Perceived Risk

In mobile banking, the absence of face-to-face verification and physical documentation

places greater reliance on customer trust as a substitute for some of the assurance mechanisms traditionally provided through branch-based interactions. [Alrawad et al. \(2023\)](#) demonstrated that both trust and perceived risk influence intentions to use near-field communication payment systems, with perceived risk producing the more pronounced negative effect. Similarly, [Lim et al. \(2019\)](#) found that perceptions of security and users' knowledge contribute to their intention to continue using mobile financial services. This indicates that effective assurance depends not only on the technical safeguards incorporated into a digital system but also on customers' ability to understand and use those safeguards appropriately. In the context of commercial banking in Pakistan, [Zhang et al. \(2023\)](#) further established that data security directly contributes to customer trust, which subsequently influences the intention to adopt digital banking services.

These findings have two important implications for the present investigation. First, trust and security should not be treated as a single, homogeneous concept. Customers may simultaneously hold different levels of confidence in the banking institution, the underlying technology, and the legal mechanisms available to protect them, and these forms of assurance may develop at different rates. Second, legal and regulatory protection represents a comparatively underexplored dimension and may be particularly vulnerable in banking environments where frameworks for protecting consumers in electronic financial transactions remain underdeveloped. Evidence from rural customers during the COVID-19 pandemic provided by [Al Amin et al. \(2022\)](#) reinforces this concern, showing that security-related apprehensions remained relevant even among individuals who were already using digital financial services. Familiarity with mobile banking, therefore, does not necessarily eliminate concerns regarding security or establish the level of assurance required for sustained use.

Service Quality, Satisfaction, and Loyalty

A separate stream of research conceptualises mobile banking primarily as a service and evaluates it through the established relationship between service quality, customer satisfaction, and loyalty. [Zhou et al. \(2021\)](#) identified several service-quality attributes associated with customers' intentions to remain loyal to mobile banking services. Using text-mining techniques on reviews posted by Pakistani users, [Hussain et al. \(2023\)](#) adopted a more data-driven approach by deriving quality dimensions from user-generated content rather than relying exclusively on established measurement scales. Their findings indicated that reliability and responsiveness were among the most prominent concerns expressed by users. Similar relationships have been reported in other developing-market contexts. [Ayinaddis et al. \(2023\)](#) found that electronic banking service quality significantly influences both customer satisfaction and loyalty among Ethiopian users, while [Gautam and Sah \(2023\)](#) identified comparable patterns in the context of online banking in Nepal. Research by [Esawe \(2022\)](#) further illustrates the distinction between behavioural intention and actual usage among mobile wallet users, showing that inconsistent service quality can prevent positive intentions from developing into sustained utilisation.

Evidence from regional settings provides additional support for this service-quality perspective. [Hamidi and Safareeyeh \(2019\)](#), examining mobile banking adoption in Iran, found that adoption can strengthen customer interaction and satisfaction when the service consistently fulfils the functions that users consider important. The relevance of this finding to Iraq is notable given the structural similarities between the two regional banking environments. In a different service context, [Foroughi et al. \(2024\)](#), drawing on technology continuance theory, likewise demonstrated that satisfaction acts as an intermediary between confirmation of expectations and continued system usage. Collectively, this body of evidence suggests that an overall measure of customer satisfaction may conceal weaknesses associated with particular service functions. This provides the methodological basis for the disaggregated indicator-level analysis presented in Section 5, where individual capabilities are examined rather than allowing an aggregate score to obscure specific areas of weakness.

Financial Inclusion and Banking Sustainability

Sustainable development is generally understood as a development approach that satisfies contemporary needs while safeguarding the capacity of future generations to satisfy their own requirements. Within the financial context, financial sustainability concerns an institution's capacity to discharge its present and anticipated financial commitments without relying on debt rescheduling. Sustainable banking development extends this principle to the wider provision of banking services. It involves delivering a broad and continually evolving range of innovative financial services that respond to the requirements of customers and society, support profitability, and minimise adverse environmental effects, while also facilitating the financing of projects that contribute to sustainable development. Technology is an important component of this approach because digital service delivery can reduce the physical and logistical resources associated with conventional banking while allowing financial institutions to reach a wider customer base.

A growing body of empirical research supports an association between digital financial channels and greater financial inclusion. [Kouladoun et al. \(2022\)](#) demonstrated that digital technologies make a significant contribution to financial inclusion across Sub-Saharan Africa, while [Saeed and Donkoh \(2024\)](#) identified a similar relationship at the individual customer level among commercial bank users in an emerging economy. [Maity and Sahu \(2023\)](#) further demonstrated that expanding branch outreach can improve access to financial services, although greater availability does not necessarily result in actual utilisation. This distinction reflects the demand-side issue examined in the present study, where access to a mobile banking channel must be distinguished from customers' willingness and ability to use it effectively. Research by [Mogaji et al. \(2021\)](#) provides an additional dimension, showing that deficiencies in trust disproportionately affect financially vulnerable customers, precisely the population groups that financial inclusion policies seek to incorporate more fully into the formal financial system.

The consequences of financial inclusion also extend to the sustainability and resilience of banking institutions. Wang and Luo (2022) found evidence that greater financial inclusion contributes to bank stability in emerging economies, while Yakubu and Musah (2024) reported a positive relationship between financial inclusion and bank profitability. In China, Yang and Masron (2023) demonstrated that financial inclusion moderates the relationship between digital transformation and bank performance, suggesting that the economic benefits of technological investment are realised partly through broader financial participation rather than through technology adoption in isolation. Reviewing the wider literature, Ozili (2025) observed that empirical research has established the association between inclusion and related outcomes more convincingly than the mechanisms responsible for that relationship, highlighting the need for country-specific investigation of the intermediate conditions involved.

Koomson et al. (2023) provide evidence of one such mechanism by demonstrating that trust in banking institutions can promote financial inclusion by reducing customers' reluctance to seek financial services. Sharma et al. (2022) identify another pathway, showing that social media can influence consumers' adoption of mobile banking. Building on these strands of evidence, the present study focuses directly on the intermediate conditions linking digital banking with inclusion and sustainability, treating usability and assurance as the immediate capabilities that determine whether technological availability can translate into sustained customer engagement and broader financial participation.

Demographic Segmentation of Adoption

A recurring pattern in research on digital banking adoption is the concentration of both initial uptake and continued engagement within demographic groups. Investigating South African millennials, Thusi and Maduku (2020) found that younger users tend to demonstrate stronger acceptance of mobile banking while also showing greater responsiveness to the quality of the interface. Consequently, a design deficiency that may be tolerated by an older customer can become sufficient for a younger user to discontinue the service. Geebren et al. (2021) similarly showed that satisfaction within mobile service environments depends on the degree to which system performance corresponds with user expectations, with this correspondence varying according to characteristics such as age and educational attainment. Esawe (2022) further identified a distinction between what mobile wallet users report intending to do and how they actually behave, attributing part of this divergence to differences in digital competence among users.

These observations introduce an important methodological qualification for the present research. Sampling individuals who already use a digital banking channel inherently conditions the sample on the outcome being investigated. Individuals who regarded the service as sufficiently unsatisfactory to avoid adoption altogether, or who discontinued

use after adopting it, are absent from such a sample. The resulting assessments may therefore provide an upwardly biased representation of perceptions across the broader population. This potential optimism is likely to be amplified when the respondents are disproportionately younger and more highly educated, as is commonly observed in technology-adoption research. [Mogaji et al. \(2021\)](#) demonstrated that financially vulnerable customers encounter greater barriers associated with trust than the wider banking population. Accordingly, weaknesses identified among relatively advantaged existing users may reasonably be expected to become even more pronounced when the assessment is extended to the wider customer base. [Sharma et al. \(2022\)](#) introduce another consideration by demonstrating that exposure through social media can independently influence mobile banking adoption. Observed usage may therefore reflect not only perceptions of service quality but also differences in the extent to which potential users are reached through digital communication channels.

The literature also highlights the importance of considering adoption as a process that unfolds over time. Through a meta-analysis, [Franque et al. \(2021\)](#) demonstrated that the factors influencing continuance are systematically different from those associated with initial acceptance, with confirmation of users' prior expectations becoming particularly important after the trial stage. [Foroughi et al. \(2024\)](#) likewise demonstrated, in a related service setting, that satisfaction mediates the relationship between confirmation and continued use. This distinction has a direct practical implication for banking institutions: adoption figures alone cannot establish whether digital services have achieved durable usage. A customer may install a mobile banking application following a promotional campaign but discontinue using it after encountering difficulties with a fund transfer. Such a customer remains classified as an adopter in a cross-sectional adoption measure yet makes little contribution to the sustained expansion of digital financial services. Assessing the individual functions that either confirm or violate customer expectations is therefore essential for determining whether observed adoption can ultimately produce the financial inclusion outcomes associated with digital banking in the sustainable development literature.

Research Gap

Three principal deficiencies can be identified in the existing body of research. First, the geographical coverage of empirical evidence remains uneven. Much of the available adoption research is concentrated in South Asian, Sub-Saharan African, and Gulf countries, while Iraq has received very limited attention. This represents an important omission because the country's continued reliance on cash and comparatively low levels of financial intermediation provide a distinctive environment in which established assumptions about digital banking adoption can be examined. Second, much of the existing research relies on aggregate scores for broader constructs. Although such aggregation provides a convenient summary measure, it can conceal substantial variation between individual dimensions and consequently offers limited guidance

regarding which capability should receive priority from banking institutions. Third, comparatively limited attention has been given to the legal and regulatory dimension of assurance as a distinct component of security. Technical safeguards and data protection are more commonly examined, despite the possibility that formal consumer protection may constitute a more significant weakness in markets where electronic financial services have expanded faster than the regulatory mechanisms designed to protect their users. The present study responds to these three gaps by examining eleven individual indicators, including legal protection, among Iraqi customers who already use mobile banking services.

RESEARCH METHODOLOGY

Research Design

The research adopts a quantitative cross-sectional survey methodology, framed within a descriptive-analytical design. This methodological choice reflects the study's purpose of assessing the present level of two capabilities within an established population of users, rather than examining their development over time or determining causal relationships. Data analysis was conducted using the SPSS statistical processing system, incorporating both descriptive and inferential techniques. Specifically, arithmetic means and standard deviations were calculated, while the t-test was applied to assess the extent to which the technical and technological environment of information systems is available within Iraqi banks. The assessment focused on three principal characteristics of this environment: ease of use, confidence, and safety.

Population and Sample

The target population encompasses customers of both government-owned and privately operated banks in Iraq. From this population, 130 customers were selected as the study sample, with eligibility restricted to individuals who had previously used mobile phones to access banking services. This criterion ensured that the collected responses reflected actual user experience rather than anticipated or hypothetical perceptions of mobile banking. Given the eleven substantive measurement items included in the instrument, the obtained sample corresponds to an approximate respondent-to-item ratio of 11.8:1, thereby exceeding the conventional minimum ratio generally considered adequate for this form of survey-based statistical analysis.

Instrument and Measurement

An electronic questionnaire was developed by the researchers with reference to findings from earlier studies and the theoretical framework underpinning the research. The instrument was organised into two principal sections. The first section gathered information concerning the demographic characteristics of the respondents. The second section addressed the substantive study variables and was itself divided into two parts.

Table 1: Response Scale and Levels of Materiality Applied to the Survey Instrument

Response Category	Highly Agree	Agree	Neutral	Disagree	Highly disagree
Relative Weight	5	4	3	2	1
Percentage Band	> 80%	60–80%	40–60%	20–40%	< 20%
Statistical Significance	Very High Influence	High Influence	Medium Influence	Low Influence	Zero Influence

Note: Source: Prepared by the authors based on questionnaire design. Percentage bands denote the proportion of scale range attributable to each category.

Part One assessed respondents' perceptions regarding the ease of using mobile phones for banking purposes, whereas Part Two examined the extent to which confidence and security characteristics are available within the information technology systems employed by Iraqi banks. Responses to each item were recorded on a five-point scale, with each response category assigned a corresponding relative weight in accordance with the Likert scale, as presented in [Table 1](#).

Validity and Reliability

The questionnaire was subjected to expert review to establish the appropriateness of its item formulation and to verify the validity, clarity, and relevance of its constituent statements. The review panel comprised specialists in information technology as well as internal and external auditing, whose assessments were used to confirm the suitability of the measurement instrument.

The reliability of the collected data was subsequently evaluated by examining the internal stability and consistency of respondents' answers through Cronbach's alpha. The coefficient obtained was 0.864, demonstrating a high level of internal consistency and supporting the reliability of the responses for subsequent hypothesis testing. As an alpha value of 0.60 or above is generally regarded as acceptable, the recorded coefficient comfortably satisfies the required criterion. It also lies within the range commonly characterised as good reliability and is higher than the threshold adopted in comparable studies addressing mobile banking.

Analytical Procedure

The analytical procedure was organised into three sequential stages. Initially, descriptive statistical measures were generated to characterise the respondents' demographic profile and to summarise the eleven substantive indicators included in the instrument. The analysis then focused on the mean and standard deviation of each item, with the observed means evaluated in relation to the neutral benchmark of 3.00. On the five-point response scale, this midpoint represents the point separating a negative assessment from a positive endorsement of the corresponding statement. In the final

stage, one-sample t-tests were conducted to establish whether the mean response for each dimension departed statistically from the scale midpoint. The null hypotheses specified in Section 1.4 were assessed using a conventional significance level of 5%. In addition to the test statistics, 95% confidence intervals for the difference between the observed means and the reference value are presented.

RESULTS

Demographic Profile of the Sample

Table 2 summarises the demographic profile of the respondents included in the study. The distribution indicates that the largest proportion of participants falls within the 31–40-year age category, accounting for 55% of the sample. This age group represents the segment most strongly associated with the use of technology for banking transactions. The educational profile is similarly notable, as most respondents have a university-level education.

Table 2: Demographic Characteristics of the Study Sample (N = 130)

Characteristic	Category	n	%
Panel A. Sex			
Sex	Male	93	72
	Female	37	28
Panel B. Age			
Age (years)	Less than 30	24	18
	31–40	72	55
	41–50	26	20
	Greater than 50	8	6
Panel C. Educational Level			

Table 2: Demographic Characteristics of the Study Sample (N = 130) (cont...)

Characteristic	Category	n	%
Education	Less than Secondary	15	11
	Secondary	35	27
	University	43	33
	Postgraduate	37	28
Panel D. Monthly Income (IQD)			
Income	Less than 1,000,000	18	15
	1,000,000–1,500,000	46	35
	1,500,000–2,000,000	50	38
	More than 2,000,000	16	12

Note: Source: Prepared by the authors based on survey data. IQD = Iraqi dinar. Percentages are rounded and may not sum to exactly 100.

Together, these characteristics provide useful indications for tailoring electronic banking services to the needs and preferences of this customer segment. With respect to income, the highest concentration of respondents is observed within the 1,500,000 to

2,000,000 income range, which represents 38% of the sample.

Availability of Ease-of-Use Characteristics

Table 3 reports the extent to which ease-of-use characteristics are evident in the information technology systems employed by Iraqi banks. The responses to Items 1–3 generally reflect favourable perceptions of system usability, indicating that respondents regarded these systems as relatively easy to operate and capable of delivering the required information with a high level of accuracy and within an appropriate time frame. In contrast, the final statement received comparatively weaker agreement.

Table 3: Availability of Ease-of-Use Features when Conducting Mobile Banking Services

No.	Indicator	M	SD	Rank
1	Ease of completing mobile banking transactions	3.966	0.726	1
2	Using phone banking does not require much effort	3.888	0.781	2
3	The application interface is available in the required languages	3.466	0.774	3
4	The possibility of making money transfers	2.922	0.249	5
5	The possibility of linking with the inter-bank money transfer service	2.967	0.651	4
6	Ease of viewing account details by the customer	2.855	0.758	6

Note: Source: Prepared by the authors based on analysis of questionnaire data. M = mean; SD = standard deviation. N = 130. Rank is assigned by descending mean. Values below 3.000 fall beneath the neutral midpoint of the five-point scale.

This result suggests that respondents experienced some difficulty when attempting to identify or access their accounts through mobile phones. One possible explanation is that banks have implemented precautionary authentication procedures that restrict the disclosure of customer-related information until the user's identity has been adequately verified.

The item-level results reported in **Table 3** provide a more meaningful interpretation than a single aggregated measure. The responses reveal a balanced pattern, with three indicators positioned above the neutral midpoint and the remaining three below it. Positive evaluations are associated primarily with functions that enable users to perform relatively simple and self-contained activities. By contrast, all three negatively positioned indicators concern either transferring funds between accounts or accessing account-related records. This pattern suggests that the perceived usability of the systems is not determined simply by the technical complexity of a task. Rather, it appears to reflect whether a particular banking operation can be completed directly or is constrained by additional requirements relating to verification, authorisation, or coordination between institutions. Indicator 4 is particularly noteworthy because it has the lowest variability across the entire instrument (SD = 0.249). The limited dispersion indicates a strong degree of consensus among respondents that transferring funds is not a straightforward process, rather than reflecting substantially divided opinions within

the sample.

Availability of Trust and Security Characteristics

The findings presented in Table 4 indicate that respondents generally perceive the control mechanisms and procedural safeguards governing both the physical and logical components of mobile phone technology systems within Iraqi banks to be sufficiently available. Overall, the study sample expressed agreement with the adequacy of these controls and procedures. Nevertheless, Statement 5 received the lowest mean score among the assessed items, with an arithmetic mean of 2.855. This comparatively low rating suggests that respondents are less confident in the adequacy of the legal frameworks designed to protect mobile banking users from problems or risks encountered when conducting banking transactions through mobile phones. Thus, although the technical and procedural controls are viewed favourably, the perceived legal protection available to customers appears to remain comparatively weak.

Table 4 exhibits a sharper internal structure than Table 3. Four of the five indicators cluster between 3.666 and 3.911, a narrow band indicating consistent endorsement of the bank-controlled components of assurance: confidentiality provisions, service contact, transaction alerts, and the handling of personal data. The fifth indicator breaks decisively from this cluster at 2.855, a gap of 0.811 from the next lowest value. The substantive reading is that Iraqi users distinguish sharply between assurance the bank can supply and assurance only the legal system can supply, and that they credit the former while withholding the latter. This is the single most actionable finding in the study, because it locates the binding constraint outside the individual bank's operational control.

Table 4: Availability of security and trust features when conducting mobile banking services

No.	Indicator	M	SD	Rank
1	Availability of additional information ensuring confidentiality	3.770	0.601	3
2	It is easy to communicate with customer service	3.813	0.802	2
3	Alert messages via e-mail or SMS when making any transfer	3.666	0.658	4
4	I feel safe providing my personal information	3.911	0.817	1
5	I feel confident that legal structures protect me from problems associated with this service	2.855	0.758	5

Note: Source: Prepared by the authors based on analysis of questionnaire data. M = mean; SD = standard deviation. N = 130. Rank is assigned by descending mean.

Hypothesis Testing

Table 5 shows the t-value of 3.704 for the ease-of-use dimension, which is statistically significant at the level of p less than 0.05, the two-tailed significance value reaching 0.000. This indicates that there are statistically significant differences between users'

opinions regarding the availability of ease-of-use characteristics of mobile phones in the provision of services in banks, which indicates the rejection of the null hypothesis $H0_1$ and acceptance of the alternative hypothesis $H1_1$. The average answers for the axis amounted to 3.729 with a standard deviation of 0.313, and the correlation coefficient between the answers of the study sample reached 0.511, indicating a moderate direct relationship. With the aim of testing the second hypothesis, the one-sample t-test in [Table 5](#) shows a t-value of 1.471 for the trust and safety dimension, with a reported two-tailed significance value of 0.00, which indicates statistically significant differences between users' opinions regarding the availability of trust and safety characteristics, and therefore the rejection of the null hypothesis $H0_2$ and acceptance of the alternative hypothesis $H1_2$. The average of the sample answers was 4.725 with a standard deviation of 0.078, and the correlation coefficient between the sample answers was 0.999, indicating a high correlation.

Table 5: One-Sample t-Test Results for Both Measured Dimensions

Dimension	Mean Difference	95% CI lower	95% CI Upper	t	df	Sig. (2-tailed)
Ease of Use	0.312	0.136	0.486	3.704	129	0.000
Trust and Safety	0.363	0.067	0.143	1.471	129	0.000

Note: Source: Prepared by the authors based on analysis of questionnaire data. CI = confidence interval. Values reproduced exactly as generated in the original analysis; see Section 4.5 for verification notes.

Verification of the Reported Test Statistics

Three aspects of [Table 5](#) warrant explicit clarification. They are retained in the present analysis rather than being corrected implicitly because the underlying dataset was unavailable to permit independent re-estimation. First, the dimension-level means reported in the table are inconsistent with the corresponding item-level observations presented in [Tables 3 and 4](#). The arithmetic mean of the six ease-of-use indicators is 3.344, rather than the reported value of 3.729, while the five trust indicators produce an average of 3.603 instead of the reported 4.725. In contrast, the reported mean difference of 0.312 for ease of use is broadly compatible with a test value of 3.00 and an underlying mean of approximately 3.31. This pattern suggests that the inconsistency is more likely associated with the reported dimension-level mean than with the corresponding statistical test.

Second, the trust dimension is presented with a t-statistic of 1.471 alongside a two-tailed significance value of 0.000. With 129 degrees of freedom, however, a t-value of 1.471 would produce a two-tailed probability of approximately 0.14, which is above conventional thresholds for statistical significance. The reported statistics are therefore incompatible, indicating that either the t-statistic or the associated probability has been incorrectly transcribed. Third, the confidence interval reported for the trust dimension is also internally inconsistent. Its lower limit of 0.143 is greater than its upper limit of

0.067, while neither limit encompasses the reported mean difference of 0.363. The interval therefore appears to have been entered in reverse or otherwise incorrectly transcribed.

Accordingly, the statistical evidence for the ease-of-use dimension remains internally consistent and supports a robust interpretation. By contrast, the inferential conclusion concerning the trust dimension should be regarded as provisional until the calculations can be reproduced using the original dataset. Re-estimation from the raw data is therefore recommended before publication. Importantly, the substantive discussion in Section 5 is based primarily on the item-level findings reported in [Tables 3 and 4](#). Those results are internally consistent and therefore provide an independent basis for the interpretation, without relying on the disputed dimension-level statistics in [Table 5](#).

DISCUSSION

The findings portray a mobile banking environment in which the customer-facing functionality has advanced more rapidly than the underlying institutional infrastructure. Respondents tend to value functions that can be completed independently through a well-designed application, whereas their evaluations become less favourable when successful execution depends on coordination between financial institutions or on effective legal protection. This pattern closely reflects the distinction made in the adoption literature between effort expectancy and assurance. [Shankar and Rishi \(2020\)](#) demonstrated that convenience encourages adoption intention, but that its influence is constrained by perceived risk. The Iraqi findings provide a direct illustration of this relationship: the same respondents who assign a mean score of 3.966 to transactional ease give only 2.855 to legal protection.

The particularly weak assessment of funds transfer is theoretically important because it combines the lowest ease-of-use evaluation with the smallest degree of response dispersion. [Kumar et al. \(2023\)](#) demonstrated that trust and perceived risk influence the extent to which behavioural intention develops into actual usage. A transfer facility that users consistently perceive as difficult therefore represents a substantive constraint on this transition, potentially turning customers who are willing to use mobile banking into users who engage with it only occasionally. More importantly, fund transfer represents the function through which mobile banking can replace cash-based transactions rather than simply provide an alternative means of accessing information or supplementing branch services. Its limited performance consequently restricts the potential contribution of mobile banking to the financial inclusion objectives identified by [Kouladoun et al. \(2022\)](#) and [Saeed and Donkoh \(2024\)](#). A digital channel that facilitates balance checking but does not enable customers to move funds conveniently leaves a substantial part of the cash-based financial system unchanged.

The weakness associated with legal protection deserves separate consideration. [Lim et](#)

al. (2019) established that perceived security contributes to customers' intention to continue using mobile financial services, while Zhang et al. (2023) demonstrated a pathway in which data security strengthens trust and subsequently influences adoption intention. The Iraqi results indicate that customers do not perceive assurance as a uniform attribute. They appear to recognise banks' efforts concerning confidentiality, security notifications, and the handling of personal information, while simultaneously expressing weaker confidence in the legal mechanisms available to protect them. Al Amin et al. (2022) similarly demonstrated that security concerns can remain among customers after they have already adopted digital financial services. The present findings extend this evidence by indicating the component of assurance in which the concern remains most pronounced. The problem consequently cannot be addressed solely through improvements to application design or bank-level security features. It also explains how an overall trust and security measure may appear acceptable while concealing a critical weakness in the legal-protection component.

The demographic composition of the sample also places an important qualification on the extent to which the findings can be generalised. The concentration of respondents within the 31–40 age group and the predominance of participants with university-level education correspond closely to the characteristics generally associated with greater receptiveness to digital financial technologies. The observed evaluations may therefore represent a relatively favourable assessment compared with what might be expected across the wider Iraqi population. Mogaji et al. (2021) found that deficiencies in trust can have particularly pronounced consequences for financially vulnerable customers. If relatively advantaged and technologically receptive users already assign a mean score of only 2.855 to legal protection, the corresponding constraint may be even more substantial among the populations that financial inclusion initiatives are intended to reach. Accordingly, when banking sustainability is understood in terms of the durable expansion of access to and use of financial services, the evidence suggests that Iraq's principal constraint is not the absence of mobile technology itself but the institutional conditions required to make that technology dependable, transferable, and trustworthy.

CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS

The findings provide several conclusions in response to the research questions. The respondents demonstrate a strong inclination towards using banking services delivered through mobile devices, indicating considerable acceptance of mobile banking within the sampled population. The participating banks are also perceived to provide a relatively high level of security and confidentiality. However, confidence in the institutions offering these innovative services remains uneven, and the evidence does not indicate a correspondingly strong level of confidence in their continued use. The findings further suggest that mobile banking can support greater financial inclusion and, consequently, contribute to the sustainable development of banking activities. Examination at the indicator level provides a more precise interpretation of these

results. Positive evaluations are concentrated mainly on self-contained transactional activities, whereas indicators associated with fund transfers, account inspection, and legal protection remain below the neutral benchmark.

The study recommends strengthening public awareness of mobile banking through advertising campaigns, social media platforms, and other communication channels. Banks should also seek to enhance customer confidence by improving the confidentiality and security of personal and financial information, ensuring that relevant financial information is accessible to customers, and strengthening safeguards for mobile devices. In addition, banks should develop diverse, institution-specific applications incorporating robust security mechanisms capable of reducing exposure to unauthorised access and cyber threats. Greater investment in sustainable projects is also recommended. Beyond these measures, the findings indicate that improvement should follow a clear sequence of priorities. Inter-bank fund-transfer infrastructure should receive immediate attention because this indicator records the lowest level of evaluation together with a high degree of respondent agreement, while also representing a critical condition for reducing reliance on cash. The second priority should be the redesign of account-inspection functions, ensuring that authentication and verification procedures protect customers without unnecessarily restricting legitimate access. The third priority extends beyond the capacity of individual banks. The Central Bank of Iraq and relevant legislative authorities should develop a clearly defined consumer-protection framework for electronic financial services, as deficiencies in legal protection cannot be adequately resolved through investment by individual banking institutions alone.

The findings also highlight the need for banks to reconsider how they monitor the performance of their digital services. Reliance solely on aggregate satisfaction measures or application-download statistics may conceal weaknesses in particular functions. Banks should therefore introduce indicator-level monitoring systems capable of separately tracking the performance of fund-transfer facilities, account-inspection functions, and trust and assurance mechanisms. Such monitoring would enable institutions to identify specific service deficiencies and allocate resources towards the areas in which intervention is most necessary.

From a policy perspective, the findings suggest that the marginal benefits of further investment in already well-performing customer-interface features may be lower than those generated by improvements in underlying infrastructure and legal protection. Enhancing an interface that customers already evaluate positively addresses a relatively weak constraint, whereas coordinated improvements to inter-bank settlement arrangements and statutory consumer protection directly address two of the areas performing furthest below the neutral benchmark. Accordingly, the sequencing of investment may be more consequential than the overall volume of expenditure. Resources should be directed first towards the constraints that most directly restrict wider and sustained use of mobile banking.

The theoretical contribution of the study is that aggregate construct scores can obscure meaningful variation between individual indicators, potentially concealing the precise weaknesses that are most relevant for managerial decision-making. Indicator-level reporting should therefore receive greater attention in applied research on technology adoption, particularly where different components of a construct may develop unevenly. At the practical level, the findings indicate that, in markets where digital accessibility has developed more rapidly than the surrounding institutional infrastructure, sustainable mobile banking depends not merely on the sophistication or functionality of the application but also on the credibility, security, and regulatory environment supporting it. Nevertheless, the study has several limitations, including its single cross-sectional design, its concentration on a comparatively technology-receptive segment of the population, and the statistical inconsistencies identified in Section 4.5. Future research should therefore reproduce the inferential analysis using the underlying raw dataset, incorporate non-users and rural customers into the sampling frame, and conduct longitudinal assessments of the same indicators to determine whether the identified deficiencies diminish over time.

REFERENCES

- Al Amin, M., Arefin, M. S., Alam, M. S., & Rasul, T. F. (2022). Understanding the Predictors of Rural Customers' Continuance Intention toward Mobile Banking Services Applications during the COVID-19 Pandemic. *Journal of Global Marketing*, 35(4), 324-347. <https://doi.org/10.1080/08911762.2021.2018750>
- Alrawad, M., Lutfi, A., Almaiah, M. A., & Elshaer, I. A. (2023). Examining the influence of trust and perceived risk on customers intention to use NFC mobile payment system. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(2), 100070. <https://doi.org/10.1016/j.joitmc.2023.100070>
- Alsmadi, A. A., Shuhaiber, A., Alhawamdeh, L. N., Alghazzawi, R., & Al-Okaily, M. (2022). Twenty Years of Mobile Banking Services Development and Sustainability: A Bibliometric Analysis Overview (2000–2020). *Sustainability*, 14(17), 10630. <https://doi.org/10.3390/su141710630>
- Ayinaddis, S. G., Taye, B. A., & Yirsaw, B. G. (2023). Examining the effect of electronic banking service quality on customer satisfaction and loyalty: an implication for technological innovation. *Journal of Innovation and Entrepreneurship*, 12(1), 22. <https://doi.org/10.1186/s13731-023-00287-y>
- 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>
- Esawe, A. T. (2022). Understanding mobile e-wallet consumers' intentions and user behavior. *Spanish Journal of Marketing-ESIC*, 26(3), 363-384. <https://doi.org/10.1108/SJME-05-2022-0105>

- Foroughi, B., Sitthisirinan, S., Iranmanesh, M., Nikbin, D., & Ghobakhloo, M. (2024). Determinants of travel apps continuance usage intention: extension of technology continuance theory. *Current Issues in Tourism*, 27(4), 619-635. <https://doi.org/10.1080/13683500.2023.2169109>
- Franque, F. B., Oliveira, T., Tam, C., & Santini, F. d. O. (2021). A meta-analysis of the quantitative studies in continuance intention to use an information system. *Internet Research*, 31(1), 123-158. <https://doi.org/10.1108/INTR-03-2019-0103>
- Gautam, D. K., & Sah, G. K. (2023). Online Banking Service Practices and Its Impact on E-Customer Satisfaction and E-Customer Loyalty in Developing Country of South Asia-Nepal. *Sage Open*, 13(3), 21582440231185580. <https://doi.org/10.1177/21582440231185580>
- Geebren, A., Jabbar, A., & Luo, M. (2021). Examining the role of consumer satisfaction within mobile eco-systems: Evidence from mobile banking services. *Computers in Human Behavior*, 114, 106584. <https://doi.org/10.1016/j.chb.2020.106584>
- Hamidi, H., & Safareeyeh, M. (2019). A model to analyze the effect of mobile banking adoption on customer interaction and satisfaction: A case study of m-banking in Iran. *Telematics and Informatics*, 38, 166-181. <https://doi.org/10.1016/j.tele.2018.09.008>
- Ho, J. C., Wu, C.-G., Lee, C.-S., & Pham, T.-T. T. (2020). Factors affecting the behavioral intention to adopt mobile banking: An international comparison. *Technology in Society*, 63, 101360. <https://doi.org/10.1016/j.techsoc.2020.101360>
- Hussain, A., Hannan, A., & Shafiq, M. (2023). Exploring mobile banking service quality dimensions in Pakistan: a text mining approach. *International Journal of Bank Marketing*, 41(3), 601-618. <https://doi.org/10.1108/IJBM-08-2022-0379>
- Koomson, I., Koomson, P., & Abdul-Mumuni, A. (2023). Trust in banks, financial inclusion and the mediating role of borrower discouragement. *International Review of Economics & Finance*, 88, 1418-1431. <https://doi.org/10.1016/j.iref.2023.07.090>
- Kouladoun, J.-C., Wirajing, M. A. K., & Nchofoung, T. N. (2022). Digital technologies and financial inclusion in Sub-Saharan Africa. *Telecommunications Policy*, 46(9), 102387. <https://doi.org/10.1016/j.telpol.2022.102387>
- Kumar, R., Singh, R., Kumar, K., Khan, S., & Corvello, V. (2023). How Does Perceived Risk and Trust Affect Mobile Banking Adoption? Empirical Evidence from India. *Sustainability*, 15(5), 4053. <https://doi.org/10.3390/su15054053>
- Lim, S. H., Kim, D. J., Hur, Y., & Park, K. (2019). An Empirical Study of the Impacts of Perceived Security and Knowledge on Continuous Intention to Use Mobile Fintech Payment Services. *International Journal of Human-Computer Interaction*, 35(10), 886-898. <https://doi.org/10.1080/10447318.2018.1507132>

- Maity, S., & Sahu, T. N. (2023). Bank branch outreach and access to banking services toward financial inclusion: an experimental evidence. *Rajagiri Management Journal*, 17(2), 170-182. <https://doi.org/10.1108/RAMJ-01-2022-0004>
- Merhi, M., Hone, K., & Tarhini, A. (2019). A cross-cultural study of the intention to use mobile banking between Lebanese and British consumers: Extending UTAUT2 with security, privacy and trust. *Technology in Society*, 59, 101151. <https://doi.org/10.1016/j.techsoc.2019.101151>
- Mogaji, E., Adeola, O., Hinson, R. E., Nguyen, N. P., Nwoba, A. C., & Soetan, T. O. (2021). Marketing bank services to financially vulnerable customers: evidence from an emerging economy. *International Journal of Bank Marketing*, 39(3), 402-428. <https://doi.org/10.1108/IJBM-07-2020-0379>
- Ozili, P. K. (2025). Financial inclusion in banking: A literature review and future research directions. *Modern Finance*, 3(1), 91-109. <https://doi.org/10.61351/mf.v3i1.236>
- Saeed, M. M., & Donkoh, E. (2024). Mobile banking services and financial inclusion among customers of commercial banks: Evidence from an emerging economy. *Business Strategy & Development*, 7(4), e70035. <https://doi.org/https://doi.org/10.1002/bsd2.70035>
- Shankar, A., & Rishi, B. (2020). Convenience Matter in Mobile Banking Adoption Intention? *Australasian Marketing Journal*, 28(4), 273-285. <https://doi.org/10.1016/j.ausmj.2020.06.008>
- Sharma, M., Banerjee, S., & Paul, J. (2022). Role of social media on mobile banking adoption among consumers. *Technological Forecasting and Social Change*, 180, 121720. <https://doi.org/10.1016/j.techfore.2022.121720>
- Thusi, P., & Maduku, D. K. (2020). South African millennials' acceptance and use of retail mobile banking apps: An integrated perspective. *Computers in Human Behavior*, 111, 106405. <https://doi.org/10.1016/j.chb.2020.106405>
- Wang, R., & Luo, H. (2022). How does financial inclusion affect bank stability in emerging economies? *Emerging Markets Review*, 51, 100876. <https://doi.org/10.1016/j.ememar.2021.100876>
- Yakubu, I. N., & Musah, A. (2024). The nexus between financial inclusion and bank profitability: a dynamic panel approach. *Journal of Sustainable Finance & Investment*, 14(2), 430-443. <https://doi.org/10.1080/20430795.2022.2105792>
- Yang, F., & Masron, T. A. (2023). Does financial inclusion moderate the effect of digital transformation on banks' performance in China? *Cogent Economics & Finance*, 11(2), 2267270. <https://doi.org/10.1080/23322039.2023.2267270>
- Zhang, W., Siyal, S., Riaz, S., Ahmad, R., Hilmi, M. F., & Li, Z. (2023). Data Security, Customer Trust and Intention for Adoption of Fintech Services: An Empirical Analysis From Commercial Bank Users in Pakistan. *Sage Open*, 13(3), 21582440231181388. <https://doi.org/10.1177/21582440231181388>
- Zhou, Q., Lim, F. J., Yu, H., Xu, G., Ren, X., Liu, D., Wang, X., Mai, X., & Xu, H. (2021). A study on factors affecting service quality and loyalty intention in

mobile banking. *Journal of Retailing and Consumer Services*, 60, 102424.
<https://doi.org/10.1016/j.jretconser.2020.102424>