Sci. Technol. Arts Res. J., Jan. – March 2024, 13(1), 28-45
DOI: https://doi.org/10.20372/star.v13i1.03
ISSN: 2226-7522 (Print) and 2305-3372 (Online)
Science, Technology and Arts Research Journal
Sci. Technol. Arts Res. J., Jan. – March 2024, 13(1), 28-45
Journal Homepage: https://journals.wgu.edu.et

Original Research

Impacts of Digital Banking on Bank Performance and Its Determinants: Empirical Evidence from Nekemte District Banks

Elfenesh Muleta*[1] & Damu Feyera [2]

[1] Department of Economics, College of Business and Economics, Wollega University, Ethiopia
[2]Department of Banking and Finance, College of Business and economics, Wollega University, Ethiopia

Abstract

Using data collected from banks in the Nekemte district, this study aims to determine how digital banking has affected bank performance and what factors have contributed to this effect. In addition to conducting focus groups with prospective experts and key informant interviews with district bank managers, we surveyed 346 sample consumers of the area's banks to compile the data used in this study. The logistic regression method was used to estimate the outcomes, taking into consideration the characteristics of the data. According to the results, the research area's digital banking adoption is heavily impacted by factors such as consumer education, availability of energy, customer awareness, internet connectivity, ICT literacy, and the quality of digital banking services. The study also shows that banks perform better when they use digital banking. Some of the most common forms of electronic banking in this area are ATMs, mobile banking, online banking, and POS systems. These findings have important policy implications, suggesting that financial institutions should make raising public knowledge of digital banking a top priority. Digital banking can be improved, its impact on bank performance can be amplified, and its adoption in the district can be accelerated through investments in basic infrastructure and human capital.

Article Information

Article History:
Received: 12-01-2024
Revised : 20-02-2024
Accepted : 30-03-2024

Keywords:
Digital banking adoption, logistic regression, ICT literacy, Nekemte Districts

*Corresponding Author:
Elfenesh Muleta

E-mail:

elfeneshmb@gmail.com

INTRODUCTION

The 21st century is renowned for the swift progression of digital technologies, specifically within the domain of Information and Communication Technologies (ICT). The development of ICT infrastructure stands out as a crucial element that marked the commencement of the third industrial revolution. The automation of production and services, driven by the widespread embrace of electronic and digital technologies, initiated this revolution in the 1960s.

The banking sector, a firmly established financial institution, utilizes digital technology to deliver its services. The sector employs digital finance as a critical solution to address customers' growing needs through the use of electronic devices. The integral banking system, crucial to the economy, is heavily

dependent on information technology, which has consequently become the cornerstone of banking activities.

In recent years, digital banking has experienced rapid growth, resulting in substantially reduced costs and heightened competition in the financial services industry. This expansion aims to include individuals without banking access into the system, offering them avenues to improve financial management and empowerment. The acceptance and broadening of electronic banking play a pivotal role in the transition towards a cashless society, fostering economic transparency, efficiency, and growth. From the customer's perspective, the recognised drivers for the widespread adoption of electronic banking include convenience, reliability, widespread availability, affordability, and service utility.

Despite the significant contribution that digital banking makes to comprehensive progress, its implementation remains in an initial phase across all banks in Ethiopia, particularly in the specified study area.

Researchers have conducted several empirical studies on the development of digital banking in Ethiopia, specifically focusing on Nekemte town. Examples include Fetu's (2019) study titled "Opportunity and Challenges of Electronic-Banking System in Commercial Bank of Ethiopia," exploration of "Opportunities and Challenges for the Adoption of E-Banking," investigation into the "Determinants of Customers E-Payment Utilisation in Commercial Bank of Ethiopia: The Case of Nekemte Town," among others. Despite these efforts, researchers argue that there remains a limited body of work on the impacts of digital banking on bank performance and its determinants. Therefore, this study aims to address this existing research gap by examining the impacts of digital banking on bank performance and its determinants, offering empirical evidence from Nekemte district banks.

MATERIALS AND METHODS

Descriptions of study area

This study was conducted in the banks of Nekemte district, and the district's head office is situated in Nekemte town, which is located 328 km west of the country's capital city, Addis Ababa. The town is positioned at a latitude of 9°5'N and a longitude of 36°33'E, with an altitude ranging from 1960m to 2170m above sea level (Nekemte Administration Office Report, 2019).

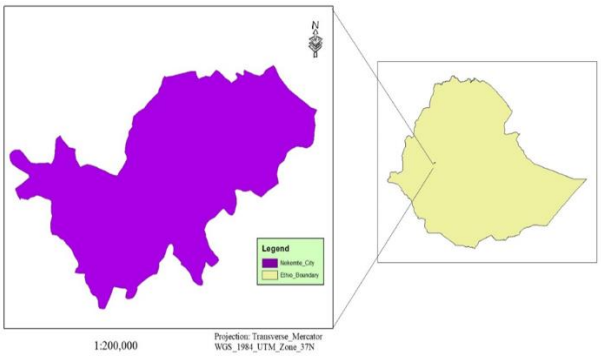

Figure 1. *Map Nekemte City*

In the district, there are both private and government commercial banks. The dominant banks in the district include the Commercial Bank with 77 branches, Oromia Bank with 45 branches, Oromia Cooperative Bank with 44 branches, and Awash Bank with 51 branches. The total number of staff in the selected branches of these four banks is 3365.

Data sources and description

The study aims to analyse the impacts of digital banking on bank performance and its determinants in Nekemte district banks, covering both government and private commercial banks. It utilises a mixed-methods research approach, combining qualitative and quantitative methods. We use a binary logistic regression model that aligns with the study objectives and includes a detailed discussion of model specifications.

To achieve the objective, both primary and secondary data sources were utilized. Secondary data came from banks' annual financial reports and related sectors at various levels. Primary data was collected from selected respondents through structured questionnaires, interviews, and focus group discussions.

Four major banks in the area were purposefully selected for data collection: Commercial Bank of Ethiopia, Awash Bank, Oromia Bank, and Oromia Cooperative Bank under Nekemte district. A total of 346 bank customers from Nekemte, Gimbi, Arjo, and Sibu Sire were chosen using convenience and judgmental sampling methods, identified through branch discussions with managers who highlighted major digital banking users. Additionally, key informant interviews and one focus group discussion were conducted with bank managers and experts at the head offices of the selected banks.

The necessary data were obtained through questionnaires, short interviews with bank managers, and one focus group discussion with experts in the field at the head office level. Information regarding demographic characteristics, customer perceptions, and views on various aspects influencing the decision to adopt digital banking was presented in the form of statements scored on a 5-point Likert-type scale, where 1="strongly agree," 2="Agree," 3="Disagree," 4="Strongly disagree," and 5="Neither disagree nor agree."

Econometric model Specification

Depending on the nature of the dependent variable (adoption of digital banking), a logistic regression model was employed in this study. Digital banking, as considered in this research, includes the utilisation of various e-banking activities:

Automated Teller Machines (ATM)

An electronic terminal that provides consumers with banking services at almost any time, allowing them to withdraw cash, make deposits, or transfer funds between accounts using an ATM card and a personal identification number (PIN).

Point-of-Sale Transfer Terminals (POS)

This system enables consumers to pay for retail purchases with a check card (debit card), where the money is immediately transferred from the debit card holder's account to the store's account.

Internet/Extranet Banking

An electronic home banking system using web technology, allowing bank customers to

conduct their business transactions with the bank through personal computers.

Mobile Banking

A service that enables customers to perform certain banking services, such as account inquiries and fund transfers, using Short Text Messages (SMS).

The primary independent variables in this study, including security risk, lack of trust, legal and regulatory framework, ICT infrastructure development, ICT skill, customer awareness of digital banking, internet access, access to electricity, and the quality of digital banking, were employed. The logistic regression method was used to estimate the model outlined above.

$$pr(y=1) = \frac{e^{x\beta}}{1+e^{x\beta}} = \aleph(x\beta)$$

Or equivalently, $p(y=1) = \frac{1}{1+e^{-x\beta}}$

Where $x\beta = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \cdots + \beta_N x_N$

Since it is mandatory to estimate the marginal effects in logistic regression model which given by:

$$\frac{\partial p(y=1)}{\partial x_k} = \frac{e^{x\beta}}{(1+e^{x\beta})2} \frac{\partial (x\beta)}{\partial x} = \frac{e^{x\beta}}{(1+e^{x\beta})^2}\beta_k$$

$$= \aleph(x\beta)(1 - \aleph(x\beta))\beta_k$$

$$= pr(y=1)xpr(y=o)x\beta_k$$

$$Dbk = \beta_1 Sr + \beta_2 Lt + \beta_3 Lrf + \beta_3 Icti + \beta_4 Icts + \beta_5 sb + \beta_6 Ae + \beta_7 ab + \varepsilon$$

Where "Dbk" denotes digital banking adoption, "Sr" is used for security risk, "Lt" for lack of trust, "Llf" indicates legal and regulatory framework, and "Lrf" denotes ICT infrastructure development, whereas "Ics" is used for ICT skill, "Ibq" for digital quality, "Ab" for awareness, and finally, "Ae" indicates access to electricity.

To sum up digital banking adoption is a dependent variable whereas; security risk, lack of trust, Legal and regulatory framework, ICT infrastructure development, ICT skill, customer awareness and quality of digital banking were taken as explanatory variable and Logistic regression was used as method of data analysis for this objectives. Finally simple descriptive statistics is used to analyse about main digital banking services in the area.

RESULTS AND DISCUSSION

Descriptive Statistics

In this sub-section, descriptive statistics for both categorical variables and continuous variables are presented. The descriptive statistics for categorical variables are assessed in terms of percentages and frequencies, whereas the mean and standard deviation are used for continuous variables.

Descriptive statistics for categorical variables

As shown in Table 1 below, 65.9% (228) of the respondents are male, while the remaining 34.10% (118) are female. This suggests that males are more inclined to use digital banking compared to females. The results also indicate that 46% (162) of the respondents use digital banking, while 54% (184) do not. This implies that the majority of respondents in the area are not adopting digital banking.

Regarding the occupational background of the respondents; concerning occupational information, the results suggest that 45.95% (159) of the respondents are businessmen, 30.64% (106) are employees, and 23.41% (81) are self-employed. This indicates that the majority of e-banking users are businessmen, followed by employees.

In terms of educational level, 57.8% (200) have a tertiary level education, 26.59% (92) have a secondary school education, and 15.61% (54) have a primary school education. The descriptive statistics reveal that the level of digital adoption is influenced by the educational level of the respondents. From the descriptive results, the majority of the respondents have no ICT skills (9.54%, (206), while only 40.46% (140) have basic ICT skills.

Table 1

Descriptive statistics for categorical variables

Variable		Categorical variables			
		Freq.	Perc.	Com.	Total
Digital banking	Users	162	46.82	53.18	346
	Non users	184	53.18	100.00	
Sex	Female	118	34.10	34.10	346
	Female	228	65.90	100.00	
Occupation	Self employed	106	30.64	30.64	346
	Business man	81	23.41	54.05	
	Employee	159	45.95	100.00	
Educational level	Secondary	92	26.59	26.59	346
	Primary school	54	15.61	42.20	
	Tertiary	200	57.80	100.00	
ICT skill	Illiterate	164	47.4	47.4	346
	Literate	140	40.46	87.86	
	Semi-literate	42	12.14	100.00	
Awareness on e – banking	Strongly agree	101	29.19	29.19	346
	Agree	115	33.24	62.43	
	Disagree	122	35.26	97.69	
	Strongly disagree	8	2.31	100.00	
	Neither	0	0	0	
Internet access	Strongly agree	20	5.78	5.78	346
	Agree	153	44.22	50.00	
	Disagree	136	39.31	89.31	
	Strongly disagree	0	0	0	
	Neither	37	10.69	100.00	
Access to electricity	Strongly agree	31	8.96	8.96	346
	Agree	266	76.88	85.84	
	Disagree	44	12.72	98.55	
	Strongly disagree				
	Neither	5	1.45	100.00	
customer perceived risk	Strongly agree	41	11.85	11.85	346
	Agree	116	33.53	45.38	
	Disagree	127	36.71	82.08	
	Strongly disagree	26	7.51	89.60	
	Neither	36	10.40	100.00	
lack of Trust	Strongly agree	41	11.85	11.85	346
	Agree	120	34.68	46.53	
	Disagree	123	35.55	82.08	
	Strongly disagree	25	7.23	89.31	
	Neither	37	10.69	100.00	
Internet banking quality	Strongly agree	34	9.83	9.83	346
	Agree	146	42.20	52.02	
	Disagree	126	36.42	88.44	
	Strongly disagree	5	1.45	89.88	
	Neither	35	10.12	100.00	

Source; Survey, 2023

The descriptive statistics in Table 1 also reveal that 38% (130) of the respondents lack awareness about digital banking in the study area, and 50% (173) of the respondents do not have access to the internet, which is a crucial component of digital banking. The findings suggest that 45% (147) of respondents refrain from using e-banking due to fear of risks, and 46.53% (162) of respondents express a lack of trust in digital banking.

Table 2

Descriptive statistics for continuous variables

S/No	Variables	Mean	Std.
1	Age of the respondents	35.164	8.42
2	Household Income	44.15	25.96

Source; Survey, 2023

The results of descriptive statistics in Table 2 show that the age of the respondents has a mean of 35.164 years with a standard deviation of 8.42. Additionally, household income, which exists in the model, has a mean and standard deviation of 44.15 and 25.96, respectively**.**

Empirical Findings and Discussion

Table 3 indicates that access to electricity positively predicts digital banking adoption (0.0065), implying that as access to electricity increases by one percent, the probability of adopting digital banking increases by 0.0065 percentage points at a 5% significance level. The result highlights that access to electricity plays a crucial role in the effectiveness and widespread adoption of digital banking services. Electricity influences digital banking in several ways. For instance, electricity is a fundamental requirement for the operation of digital infrastructure such as servers, data centres, and telecommunication networks. A stable power supply ensures that these facilities operate continuously, providing uninterrupted digital banking services.

The results of key informant interviews and focus group discussions also indicate that areas

with reliable access to electricity are more likely to have better digital banking infrastructure. In contrast, areas with inconsistent or no power supply may face challenges in establishing and maintaining digital banking services in the district. This can contribute to a digital divide, where certain populations have limited access to online financial services in the study area. The lack of electricity can be a barrier to financial inclusion. People in remote or underserved areas may find it challenging to access digital banking services if there is no reliable power source. Closing this gap requires not only expanding digital infrastructure but also ensuring access to electricity.

A stable electricity supply is crucial for ensuring the reliability of digital banking platforms. Power outages or fluctuations can disrupt online transactions, leading to potential financial losses or inconvenience for users. The stability of the power grid directly influences the reliability of digital banking services. Moreover, access to electricity

enables customers to use digital devices such as smartphones, tablets, or computers for accessing banking services. In areas without reliable power, customers may face challenges keeping their devices charged, limiting their ability to engage with digital banking platforms regularly.

Automated Teller Machines (ATMs) require a stable power supply for their operation. In areas with inconsistent electricity access, ATMs may face downtime, affecting the availability of cash withdrawals and other banking services for users.

In summary, access to electricity is a foundational element that underpins the functionality, reliability, and accessibility of digital banking services. It is a crucial factor in promoting financial inclusion and ensuring that a wide range of users can benefit from the convenience and efficiency offered by digital financial platforms. This finding is supported by Houngbonon et al., (2021), who found that access to electricity affects the level of digital banking.

Access to internet service positively influences digital banking (0.0021), indicating that a unit increase in a person is associated with a 0.0021 percentage increase in the probability of adopting digital technology at a 5% level of significance. The findings of this study explain that access to the internet plays a pivotal role in shaping the landscape of digital banking. There are several ways in which internet access influences and enhances digital banking. Among these, Online Banking Platforms are essential. Internet access is a prerequisite for using online banking platforms, allowing users to check account balances, review transaction histories, and perform various financial transactions conveniently from their devices. Additionally, internet connectivity is crucial for mobile digital banking. Through mobile apps, users can engage in real-time transactions, fund transfers, bill payments, and manage accounts using smartphones or tablets.

Internet banking is a vital component of financial inclusion. Internet access significantly contributes to financial inclusion by enabling individuals, even in remote areas, to connect with digital banking services. This helps bridge the gap between traditional banking and underserved populations, fostering economic inclusion. Furthermore, internet access is crucial for ATM and Branch Locators. Online access allows users to find the nearest ATMs or bank branches through digital tools and maps, enhancing the overall accessibility of banking services and aiding users in locating physical points for specific needs.

Access to the internet is also instrumental in enabling digital banking, providing users with electronic statements and notifications. This instant access to financial information enhances transparency and allows users to stay informed about their account activities promptly. Moreover, it facilitates online shopping and transactions, enabling users to make purchases, pay bills, and conduct various financial transactions seamlessly through e-commerce platforms, integrating their digital banking services with other online activities.

The findings of this study also indicate that Internet-based digital banking platforms leverage data analytics to understand user behavior. This information enables banks to offer personalised services, targeted promotions, and customised financial advice, enhancing the overall customer experience.

Additionally, users with internet access receive real-time updates and alerts on their devices, including notifications for transactions, account balances, and potential security concerns, enabling prompt action and awareness.

In summary, access to the internet is a fundamental enabler of digital banking. It enhances the convenience, accessibility, and security of financial services, contributing to financial inclusion and transforming the way individuals manage their finances in the modern era. The result of this paper is also supported by Wang (2006), who found that access to the internet positively affects digital banking.

The result of logistic regression indicates that a lack of awareness of digital banking negatively affects digital banking adoption (-0.1148), meaning that a lack of awareness of digital technology in the banking industry hinders digital banking adoption in the study area. From the result, it is possible to explain the effect of the lack of awareness of digital technology as follows: The lack of awareness about digital banking can have significant effects on customers using the technology and the overall adoption of digital financial services. Lack of awareness may result in individuals not realising the full range of financial services available through digital banking. This can lead to limited access to services such as online payments, fund transfers, and electronic statements, hindering their ability to manage finances efficiently. Individuals who are not aware of digital banking options may be excluded from the benefits of the modern financial system. This exclusion can perpetuate financial inequality, as those without awareness might miss out on opportunities for convenient and inclusive banking services.

Furthermore, insufficient awareness of digital banking features and security measures can render individuals more vulnerable to fraud or scams. Educational campaigns play a crucial role in enlightening users on safe online practices, enabling them to identify potential risks and safeguard their financial information. The lack of comprehension regarding the benefits of digital banking may lead individuals to hesitate about shifting from traditional banking methods. This reluctance may arise from uncertainties, a lack of trust, or misunderstandings regarding the intricacies and security of digital financial platforms.

Digital banking presents an opportunity for financial education and literacy. Insufficient awareness implies a missed opportunity to educate individuals about budgeting, saving, and making well-informed financial decisions through digital tools. Taking a broader view, communities with limited awareness of digital banking may undergo a deceleration in economic development. Digital financial services are frequently associated with economic growth, and a lack of awareness can impede the adoption of these services, thereby impacting the overall financial well-being of a community.

Moreover, a deficiency in awareness can present challenges to government initiatives aimed at fostering financial inclusion. If individuals are not cognizant of the advantages of digital banking, they may not actively engage in programs crafted to integrate them into the formal financial sector. Empirical studies conducted by Shanmugapriya and Lakshmirani (2021) and Noreen (2015) further illustrate the impact of customer awareness on digital banking.

To address the effects of the lack of digital bank awareness, it is essential to implement targeted educational campaigns, workshops, and outreach programs. These efforts can help individuals understand the advantages of digital banking, mitigate security concerns, and empower them to make informed choices regarding their financial transactions and management. Empirical research by(Shanmugapriya & Lakshmirani, 2021; Noreen, 2015) also shows how

Similarly, as indicated in Table 3 above, the result also indicates that customers' lack of trust in digital banking hurts their adoption of digital banking. This result was triangulated with key informant interviews and focus group discussions. According to the findings from focus group discussions (FGD) and key informant interviews, digital banking is affected by a lack of customer trust in this new technology due to various factors. For instance, security concerns are the main reason that erodes customer trust in e-banking. High-profile data breaches and cyber-attacks on financial institutions have raised concerns about the security of personal and financial information. Customers worry that their sensitive data could be compromised, leading to unauthorized access, identity theft, or financial loss. Instances of online fraud, phishing scams, and other cybercrimes are also creating apprehension among customers. The fear of falling victim to fraudulent activities can discourage individuals from embracing digital banking.

Table 3

Logistic regression result

Digital banking adoption	Dy/dx	St.Err.	z	Sig
Age	-.00076	.0537086	-0.01	
Sex	-.004441	.0029037	-1.53	**
Access to electricity	.0065049	.0242762	0.27	**
Access to internet	.002101	.042267	0.05	**
Lack of awareness on digital banking	-.1148015	.0367182	-3.13	***
customer perceived risk	.0133127	.0652071	0.20	
Lack of trust	-.0048704	.0647392	-0.08	**
Lack of Internet banking quality	-.173982	.0441589	-3.94	***
Educational Level	.0706312	.0461338	1.53	**
Respondents occupation	.0341252	.0384783	0.89	
ICT skill	.0568797	.0431255	1.32	***
Household Income	.0002286	.0009549	0.24	
Average marginal effects				
Observations				345

Source, survey 2023

Secondly, privacy issues, such as customers being wary of the extensive data collection practices employed by digital banks, contribute to eroding trust. The fear that their personal information might be used or sold without consent can erode trust. Surveillance concerns, where some individuals are apprehensive about the potential surveillance associated with digital transactions, contribute to the perception that their financial activities are constantly monitored, making them feel unsettled.

Thirdly, technology reliability is reflected in system outages. Instances of system outages or technical glitches can disrupt digital banking services, leading to frustration and mistrust among customers. Dependence on technology makes customers vulnerable to disruptions, and any downtime can be perceived as a risk.

Fourth, the lack of human interaction is highlighted. Traditional banking offers face-to-face interactions with bank representatives. The absence of this personal touch in digital banking can make customers feel isolated and uneasy. Concerns about the effectiveness and responsiveness of digital customer support may deter adoption.

Fifth, regulatory uncertainty, including legal and regulatory issues, is a significant factor. Concerns about the legal framework and regulations governing digital banking may contribute to a lack of trust. Customers may worry about the security of their rights and funds in the digital space.

Cultural and generational factors, such as resistance to change, play a role. Older generations or individuals with a strong attachment to traditional banking methods may resist the shift to digital banking due to unfamiliarity or discomfort with new technologies.

Regulatory uncertainty can significantly affect digital banking adoption in several ways:

Lack of Trust and Confidence: Regulatory uncertainty may lead to a lack of trust among potential users. Customers may hesitate to adopt digital banking services if they are unsure about the legal framework governing these services. Concerns about the security of their rights, privacy, and funds in the absence of clear regulations can undermine confidence in digital banking platforms.

From these findings, it is possible to conclude that to address these issues and promote digital banking adoption, financial institutions need to invest in robust cybersecurity measures, transparent privacy policies, effective customer education programs, and reliable customer support. Building trust is essential for the success of digital banking initiatives.

To mitigate these effects and encourage digital banking adoption, it is crucial for regulatory bodies to provide clear and consistent guidelines. This can create a more stable environment, fostering trust among users, and allow financial institutions to innovate and invest confidently in digital banking initiatives. Additionally, collaboration between regulators, financial institutions, and other stakeholders is essential to developing a regulatory framework that promotes both innovation and consumer protection in the digital banking sector.

As depicted in Table 3 lack of internet banking quality negatively influences growth in digital banking adoption in the district(-.174) indicates as the quality of digital

banking decrease by one percent the probability of adopting digital banking decreases by 0.174 at 1% level of significance in the district . The lack of quality in internet banking can act as a significant barrier to the growth of digital banking adoption. Several factors contribute to this negative influence, such as poor interface design. If the internet banking platform has a poorly designed interface, users may find it difficult to navigate and perform transactions. A confusing or cumbersome user experience can discourage individuals from using digital banking services.

Sometimes, digital banking is affected by limited features. When the internet banking platform lacks essential features or provides limited functionality, users may feel constrained and opt for traditional banking methods that offer a broader range of services. The absence of key functionalities can hinder the appeal of digital banking.

There are also inadequate security measures. If the internet banking system is perceived as insecure, with weak authentication methods or inadequate encryption, users may hesitate to conduct sensitive financial transactions online. Concerns about the safety of their funds and personal information can significantly impede digital banking adoption.

The lack of mobile optimization also hinders internet banking quality. As mobile devices become increasingly popular for accessing online services, a lack of mobile optimization in internet banking platforms can be a significant drawback. Users expect seamless experiences across devices, and the absence of a well-optimized mobile interface can hinder adoption.

The problem of limited integration is also another factor. If the internet banking platform does not integrate well with other digital services and platforms, users may find it challenging to manage their finances comprehensively. Seamless integration with payment services, budgeting apps, and other financial tools is essential for a holistic digital banking experience.

Ineffective customer service is another reason for low digital banking quality in this area. If customer support for internet banking-related queries is inadequate or unresponsive, users may feel unsupported and frustrated. Effective customer service is crucial for addressing user concerns and building confidence in digital banking. Likewise, the result is reinforced by Raviadaran, (2019), who found that good internet quality invites customers to adopt digital banking more.

Finally, the lack of training and educational resources also influences the quality of digital banking. If users are not provided with sufficient training or educational resources on how to use internet banking securely and effectively, they may be hesitant to adopt digital banking. Clear guidance and support can help users feel more comfortable with the technology.

To overcome these challenges and promote growth in digital banking adoption, financial institutions need to invest in enhancing the quality of their internet banking services. This includes improving user interfaces, ensuring robust security measures, addressing technical issues promptly, optimising for mobile access, integrating with other services, providing effective customer support, and offering educational resources to empower users. A positive and seamless internet banking

experience is crucial to building trust and encouraging the widespread adoption of digital banking services.

Customers' ICT literacy is also one of the important determinants of digital banking in the area. As shown in Table 3, ICT skills have a positive impact on digital technology (.057), meaning that as customers' ICT skills increase by one percent, the probability of adopting digital technology increases by 0.057 percentages. Customers need to possess basic ICT skills to navigate digital banking platforms, encompassing the understanding of computers, smartphones, and other devices, as well as familiarity with common software and applications used in online banking. ICT-literate customers are more likely to comprehend and adhere to security measures implemented in digital banking, including awareness of password security, two-factor authentication, and recognising potential online threats. A lack of ICT literacy may lead users to neglect security practices, putting their accounts at risk. Additionally, ICT-literate customers can comfortably execute various digital transactions such as fund transfers, bill payments, and mobile banking, while a lack of ICT literacy may result in customers feeling hesitant or unsure about conducting financial transactions online. Customers with higher ICT literacy are generally more adaptable to new technological advancements, likely embracing updates and new features in digital banking services, thereby enhancing their overall banking experience. ICT-literate customers can leverage online resources provided by banks, such as e-statements, online help centres, and educational materials, enabling them to make informed decisions and troubleshoot issues independently. Moreover, ICT-literate customers may prefer and be comfortable with digital communication channels, such as emails, SMS alerts, and notifications through banking apps, aligning with the communication methods typically used in digital banking. This proficiency in ICT also increases the likelihood of customers engaging with educational initiatives and training programs offered by banks to enhance their digital banking knowledge, contributing to a smoother transition to digital banking services, and this outcome is supported by Kabakus (2023).

To address the impact of customers' ICT literacy on digital banking adoption, financial institutions should invest in educational initiatives, user-friendly interfaces, and ongoing support mechanisms. Improving ICT literacy not only benefits individual customers but also fosters a more digitally inclusive banking environment, and this finding is supported by Aliyu et al. (2012).

Another significant determinant of digital banking adoption is the level of customers' education. The logistic regression result in the above table revealed that as customers' levels of education increase, the probability of customers' digital banking adoption also increases. The level of education has a positive impact on the adoption and utilisation of digital banking. Higher levels of education are often associated with increased technological literacy. Individuals with more education are generally more comfortable and adept at using digital devices, navigating online platforms, and adapting to new technologies. This proficiency in technology makes it easier for them to engage with digital banking services. Education is closely tied to

financial literacy. Those with higher levels of education tend to have a better understanding of financial concepts and instruments. This financial literacy translates into a more informed use of digital banking tools, as educated individuals are better equipped to manage and optimize their financial resources through these platforms. It contributes to a higher awareness of cybersecurity and privacy issues. Individuals with more education are often more cautious and aware of the security measures associated with online activities, including digital banking. This awareness reduces concerns about the safety of online transactions and fosters trust in digital banking platforms. Higher levels of education are indicative of a greater learning capacity. Educated individuals are generally more adept at acquiring new knowledge and skills. This learning capacity facilitates a smoother transition to digital banking, as these individuals can quickly grasp the features and functionalities of online banking platforms. Furthermore, education provides individuals with better access to information. Educated individuals are more likely to seek out and utilise online resources, educational materials, and tutorials provided by banks to enhance their understanding of digital banking. This access to information empowers them to make informed decisions about adopting and using digital banking services. Individuals with higher education levels often engage in professional or business activities that necessitate more sophisticated banking services. Digital banking, with its range of features and capabilities, has become a preferred choice for managing complex financial transactions. Educated individuals may find digital banking particularly beneficial for their professional and business-related financial needs, and they are often more comfortable with digital communication channels, such as emails, SMS alerts, and notifications through banking apps. This aligns with the communication methods typically used in digital banking. Their familiarity with these channels enhances their overall digital banking experience, and this finding is reinforced by Bansal et al. (2022).

In general, the positive impact of education on digital banking is multifaceted, encompassing technological proficiency, financial literacy, security awareness, ease of learning, access to information, and alignment with professional and business requirements. As digital banking becomes increasingly integral to financial services, education plays a pivotal role in determining individuals' readiness and capability to leverage these technological advancements for their financial management.

The result of the logistic regression model indicates there is a significant effect of gender on digital banking in the district. This influence is both in usage patterns and the overall adoption of digital financial services. There is a gender-based difference in the study area that can affect the access and usage patterns of digital banking. Studies have shown that men and women may have different levels of access to smartphones, internet connectivity, and digital devices. Unequal access can result in variations in the use of digital banking services.

The results of the key informant interview and FGD revealed gender differences in financial inclusion in the district. There are disparities in financial inclusion based on gender. Women might face challenges in

accessing and utilising digital banking services due to factors such as limited education, societal norms, or a lack of control over financial resources.

The key informant interviews also indicate the security concerns: The perception of security is a significant factor influencing the adoption of digital banking. Women may express more concerns about the security and privacy of digital transactions. Addressing these concerns through enhanced security features and educational campaigns can contribute to increased adoption.

There are also gender-based differences in financial literacy that can impact how individuals, particularly women, engage with digital banking. Efforts to improve financial education and literacy, especially among women, can empower them to make informed decisions and feel more confident using digital financial services. Moreover, tailoring digital banking products and marketing strategies to specific gender preferences and needs can influence adoption rates. Understanding the unique financial goals and challenges faced by men and women can help financial institutions create more inclusive and appealing digital banking solutions.

Women, in some cases, may prefer using mobile banking apps over other digital channels. Designing user-friendly mobile applications and ensuring that they address the specific needs and preferences of diverse users can contribute to increased digital banking adoption among women. Cultural and social factors also play a significant role in shaping gender-specific attitudes towards technology and finance. Societal norms and expectations may influence women's confidence and willingness to embrace digital banking. Initiatives to challenge gender stereotypes and promote inclusivity are essential. Finally, digital banking can play a crucial role in supporting entrepreneurship and economic empowerment. Empowering women with access to digital financial tools can contribute to their financial independence and participation in economic activities.

Understanding and addressing gender-specific considerations in the design, marketing, and accessibility of digital banking services are essential for promoting inclusivity and ensuring that the benefits of digital financial services are accessible to all, regardless of gender. Efforts towards closing the gender gap in digital banking can contribute to broader financial inclusion and empowerment. Moreover, this finding is supported by Glavee-Geo & Shaikh (2017) and Arenas-Gaitán (2011).

Major forms of digital banking in Nekemte district banks

Automated Teller Machine (ATM): the result from key informant and focus group discussion shows that the dominant digital banking form in the district is ATM. Automated Teller Machine (ATM) is an electronic machine in a public place connected to a data system and related equipment and activated by a bank customer to obtain banking services without going to the bank hall. The result also indicates that currently there is stagnation in the number of customers who use ATMs due to the instability situation in the district, and this shows the system. This is because the system is affected by incidents such as ATM fraud, which is about the fraudulent activity of gaining illegal access to someone’s ATM card and PIN to withdraw

money from their account. The customers also fear another kind of fraud: breaking into an ATM and stealing money from the machine. This finding is supported by Ebobo (2023); Mahmud (2015); and Depoju and Alhassan (2014) who found that though ATMs are convenient for users, they are affected by both physical and ATM fraud.

Second, mobile banking: though the district is still lagging behind in mobile banking, it is a relatively popular e-banking type in the district. The FGD result indicates that there are significant numbers of customers using mobile banking in the area because the system provides 24-hour service. The result of logistic regression indicated that digital banking, including mobile banking, is challenged by factors such as customer age, educational level, trust, perceived risk, digital banking quality, internet access, and access to electricity.

Third, the primary data analysis also revealed that internet banking is also used as electronic banking in the study area. The key informant interviewer and FGD participants said that the development of the financial sector in the district is referred to as virtual banking, which permits the purchaser to conduct online banking services by using the web. Customers prefer the virtual banking services when they are busy and have a hectic schedule, and they can get the service with no branches and 24 hours a day. They can transfer money and utilise it anytime, which is the greatest advantage of accessing internet banking. There is no need to visit banks for transferring money, which may be done from anywhere without visiting the banks physically. The findings of this study are supported by Sahut (2021), who found that internet banking has the advantage of facilitating money transfers and online transactions without physically visiting banks. Finally, point-of Sale (POS)-type digital banking is used in some banks in the district. Though this service is not as satisfactory, it has a good beginning.

The result of primary data analysis revealed that the point-of sale system in digital banking offers several advantages that enhance the overall customer experience and streamline financial transactions in the area. One of the key advantages of point-of-sale (POS) convenience is. It provides a convenient way for customers to make payments and conduct financial transactions. Whether it's in-store purchases, online shopping, or mobile payments, POS systems simplify the process, making it easy to complete transactions seamlessly. Speed and efficiency are also advantages of the POS system. Digital POS systems enable faster transaction processing compared to traditional methods. POS systems contribute to reducing wait times, improving customer satisfaction, and increasing overall efficiency.

POS also reduced cash handling. With the rise of digital payments, POS systems contribute to a reduction in cash transactions. This not only minimises the risk of theft but also streamlines the cash handling process for businesses, making transactions more secure and efficient.

POS is also important for transaction tracking and reporting, in which customers can easily access transactions, histories, receipts, and detailed reports through their banking apps., helping them manage their expenses and financial records more effectively.

Generally, from the result, one can conclude that, POS systems in digital banking offer a range of advantages, including convenience, speed, security, and flexibility, contributing to an enhanced customer experience and efficient financial transactions.

Effects of digital banking on bank performance

Though overall bank's performance is measured by combining qualitative information with quantitative financial metrics, due to the inconvenience of banks giving their financial information due to the existing instability situation in the district, the researcher was forced to examine bank performance in qualitative information that was gathered through key informant interviews, FGD, and observational methods.

The result of both the key informant interview and the FGD indicates that digital banking positively influences bank performance, particularly in terms of customer satisfaction. Customer satisfaction is influenced by e-banking through convenience and accessibility. Here digital banking provides customers with convenient access to bank services anytime, anywhere, and this convenience leads to higher customer satisfaction as individuals can perform transactions, check balances, and manage their accounts without the constraints of traditional hours. Generally, digital platforms increase customer satisfaction since they value the ease of use and accessibility that contribute to overbank performance. This finding is supported by (Hadid et al. 2020; Ikechukwu, 2018; Muluka et al., 2015), who found digital banking has a positive effect on customer satisfaction that increases overall bank performance.

Digital platforms also contribute to customer satisfaction by increasing efficiency in transactions. Virtual banking streamlines various transactions, reducing the time and effort required for routine tasks such as fund transfers, bill payments, and account monitoring. Moreover, it enhances the customer experience in that the efficiency gained through digital platforms is translated into a smoother customer experience, fostering satisfaction by minimizing transaction hassles, and the result is supported by Rivai (2021) and Jolly (2016).

The result revealed that virtual banking allows for personalized services, offering tailored financial solutions and product recommendations based on individual customer preferences and behaviors. As per this result, the digital banking platform improved customer satisfaction as customers felt that their banking experience was customized to meet their specific needs, which enhanced their satisfaction with the bank.

Digital banking provides real-time access to account information, transaction history, and alerts, giving customers instant visibility into their financial status. Likewise, it empowered customers, as the immediacy of information empowers customers and contributes to their overall satisfaction by allowing them to make informed financial decisions promptly.

The findings of this study also revealed that internet banking facilitates efficient communication between customers and banks through chat services, email, and notifications. The nature of the quick response of digital banking contributes to a positive customer experience and increased satisfaction in the district. The result of the study on the issue is

similar to that of Simon (2016) who found that digital banking greatly affects customer satisfaction.

In summary, digital banking enhances customer satisfaction by providing convenience, efficiency, personalization, real-time information, effective communications, innovative features, security, and avenues for customer feedback. Thus, the integration of these digital banking elements tends to outperform in terms of customer satisfaction and contributes to overall bank performance in the district.

CONCLUSIONS

The findings of this paper come with a sizable conclusion and policy implications. First, the study finds that' lack of customers' awareness of digital banking has a negative effect on digital banking. Similarly, the result indicates a lack of customer trust in digital banking, which also hurts virtual baking development in the district. As a result, the finding has the policy implication that to harness digital banking in the area, customer awareness and trust building in digital banking need special attention in the district.

Second, ICT skills have a significant positive effect on digital banking. ICT literate customers are actively using virtual baking, which contributes to the development of the sector. Hence, the financial sector should give attention to investment in ICT skills.

Third, access to infrastructure, such as individual access to electricity and the internet, positively influences digital banking, whereas problems with the quality of digital banking harm digital banking development in the area. As a result, the finding has the policy implication that, both governments and the financial sector should rely on these basic infrastructures to increase the quality of digital banking and address all areas in the district.

The result of this study shows digital banking enhances customer satisfaction by providing convenience, efficiency, personalization, real-time information, effective communications, innovative features, security, and avenues for customer feedback, which are the indicators of bank performance.

The findings of this study also indicate that, there is a good indication for the development of digital banking in the district. Among the major types of virtual banking, Automated Teller Machine (ATM), Mobile banking, Internet banking and Point of Sale (POS) are used in the district even though there is a difference from place to place in using these types.

ACKNOWLEDGEMENTS

We express sincere gratitude to Wollega University for generously providing the funds necessary to successfully conduct and complete this research.

DATA AVAILABILITY STATEMENTS

The data of this study are available from the corresponding author upon request.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

Aliyu, A. A., Bin, R., & Tasmin, H. J. (2012). The Impact of Information and Communication Technology on Banks "

Performance and Customer Service Delivery in the Banking Industry. *Int. J Latest Trends Fin. Eco. Sc. 80*, *2*(1), 80–90.

Bansal, N., Pareek, N., & Nigam, A. (2022). The impact of customer ' s training of digital banking services on its acceptability by customers ' in India The impact of customer ' s training of digital banking services on its acceptability by customers ' in India Nitin Bansal and Nishtha Pareek. *International Journal of Business and Globalisation*, *30*, 207–231.

Depoju, S. A., & Alhassan, M. (2014). Journal of Internet Banking and Commerce. *The Journal of Internet Banking and Commerce*, *15*, 1–11.

Ebobo, C. (2023). Impact of Automated Teller Machines (Atm) Frauds On Banks ' Customers In Nigeria. Fulafia, *Journals of Social Sciences*, *3*, 1–13.

Fetu, A. (2019). Opportunity and Challenges of Electronic-Banking System in Commercial Bank of Ethiopia (A Case Study on Gurage Zone).

Glavee-geo, R., & Shaikh, A. A. (2017). Mobile banking services adoption in Pakistan : are there gender differences ? *International Journal of Bank Marketing*, *35*(7), 1090–1114.

Hadid, K. I., Soon, N. K., Abusalah, A., & Amreeghah, E. (2020). The Effect of Digital Banking Service Quality on Customer Satisfaction : A Case Study on the Malaysian Banks. *Asian Journal of Applied Science and Technology*, *4*(1), 6–29.

Kabakus, A. K. (2023). The effect of digital literacy on technology acceptance : An evaluation on administrative staff in higher education. *Journal of Information Science*, 1–12. https://doi.org/10.1177/01655515231160028

Raviadaran, H. (2019). Impact of Service Quality Dimensions on Internet Banking Adoption , Satisfaction and Patronage. *International Journal of Management, Accounting and Economics*, *6*(10), 709–730.

Rivai, A. (2021). The Effect Of Digital Banking Technology On Bank Efficiency And Employee Demand In Indonesian Banking Industry. *Nat. Volatiles & Essent. Oils*, *8*(6), 1029–1048.

Sahut, J. (2021). Advantages of E-banking. *Journal of Internet Banking and Commerce An*, *26*(5), 2021.

Shanmugapriya, M. B., & Lakshmirani, D. A. S. (2021). Study on Customer Awareness towards Digital Banking Services. *PalArch's Journal of Archaeology of Egypt / Egyptology*, *18*(1), 4599–4604.

Simon, V. T. (2016). Effect of electronic banking on customer satisfaction in selected commercial banks , Kenya. *International Academic Journal of Human Resource and Business Administration*, *2*(2), 41–63.