Scientific
Research
Publishing

Use of E-Banking and Customer E-Engagement in Developing Countries: Case of NFC Bank Cameroon

Jean Robert Kala Kamdjoug[1], Arielle Ornela Ndassi Teutio[2], Ulrich Tchakounte Tchouanga[2], Jean-Pierre Gueyie[3]

[1]ESSCA School of Management, Angers, France
[2]GRIAGES, Faculty of Social Science and Management, Catholic University of Central Africa, Yaoundé, Cameroon
[3]School of Management, University of Quebec in Montreal, Montreal, Canada
Email: jean-robert.kala-kamdjoug@essca.fr, arielleteutio@yahoo.com, ulrich.tchakounte94@gmail.com, gueyie.jean-pierre@uqam.ca

Abstract

Technology-based banking has become essential in developing countries. In these countries, the financial inclusion of populations and the development of banks' portfolios depend intensely on valuable services like E-banking. This study aims to investigate the influence of some technological features of electronic financial services (Perceived personal information protection, Perceived transaction security) and service factors (Perceived time saving, Service quality, and Perceived cost-saving) on Trust and Use of e-banking. It also studies the impact of Use of E-banking on E-engagement through Usage continuance and Customer satisfaction. We use partial least squares structural equation modeling (PLS-SEM) to test a research model with a sample of 346 customers of NFC Bank in Cameroon. The study reveals that Perceived personal information protection and the service factors (Perceived time saving, Service quality, and Perceived cost-saving) influence Trust. However, Trust in E-banking does not necessarily lead to its use. On the other hand, Use of E-banking influenced by both technological features of electronic financial services (Perceived personal information protection, Perceived transaction security) and service factors (Perceived time saving, Service quality, and Perceived cost saving). The study brings managerial implications for the development of E-banking offers in developing countries.

Keywords

Electronic Banking, Use, Trust, E-Engagement, Developing Countries, Cameroon

1. Introduction

Complex and ever-changing environments frame the banking industry today (Taneja & Ali, 2021). Due to the constant innovation and evolution of electronic services, banks are subject to many challenges. Access to technological advancements has changed the consumption habits of individuals, making them more alert to novelty (Tseng et al., 2020). The mobile phone plays a crucial role in this situation. It is a tool for staying connected with others, sharing knowledge, shopping, entertainment, and, most importantly, accessing online services (Hua et al., 2019; Khatoon et al., 2020). As such, the banking system must be flexible and capable of meeting the new challenges associated with it. With the presence of the internet, the banking sector is one of the most important in terms of online services (Talwar et al., 2020). The internet has provided banking marketers many opportunities to understand customers and their needs to revolutionize the design, communication, and delivery of products and services (Al-Shbiel & Ahmad, 2016).

E-banking has been widely studied in many contexts and markets worldwide in recent times (Anderson et al., 2014; Gupta & Kamilla, 2014; Wu et al., 2014; Al-Shbiel & Ahmad, 2016). Indeed, E-banking has become one of the fundamental concepts of modern banking that helps improve the quality of banking services and provides a competitive advantage to the bank. However, its adoption remains low in sub-Saharan African countries such as Cameroon (Kala Kamdjoug et al., 2021).

So far, the literature has primarily identified the factors influencing the adoption of E-banking in developed countries located in Europe (Themistocleous et al., 2015; Ismail & Alawamleh, 2017), America (Sánchez-Torres et al., 2018) and Asia (Yang et al., 2018). Simultaneously, some have focused on the African zone and few on the specific case of Central African countries (Kala Kamdjoug et al., 2021). However, this zone includes a set of countries with significant economic growth potential. Cameroon represents the leading economy, with the best representation in banking equipment and services (COBAC, 2018). Indeed, to build valuable services offer in the country, banks, the majority being foreign subsidiaries, have been equipped with technologies to implement E-banking. They rely on it to obtain a competitive advantage and align themselves with the strategy of parent companies. Meanwhile, a large part of the national banks has experienced a significant delay and then consequently has been forced to refocus their strategy on positioning their offer based on digital. This situation is the case of the National Financial Credit Bank (NFC Bank).

NFC Bank is a Cameroonian commercial bank operating in the Cameroonian banking sector. Endowed with and servicing over 56,000 customers, fourteen (14) branches, and two sales points, it is a privately owned company operating since 2006. By February 2015, NFC bank started issuing bank cards and introduced SMS banking. Currently, about 23,000 bank cards are distributed and 15,000 Automated Teller Machine (ATM) transactions are recorded monthly,

summing up to about XAF 1.5 billion worth transactions monthly (Tchakounte, 2021). The implementation of E-banking took place in September 2017. The main reasons for this implementation decision are: 1) to reduce the displacement by its customers; 2) to reduce cash transactions; 3) to provide the application both on the national territory and abroad through Google Play Store and Appstore as well as on the web through and URL link. Since then, NFC Bank has rapidly increased its performance in terms of transaction volume, has significantly reduced operating costs, increased commissions by XAF 230 million in 2019, and has expanded the customer portfolio and users of E-banking (Tchakounte, 2021). NFC owns 5000 online customers all over the national territory, with an average of 3000 online banking transactions monthly.

In the Cameroonian context, where the level financial inclusion remains relatively low (27%) (Demirguc-Kunt et al., 2018) and where the development of digital services is nascent, it is crucial to identify the factors that lead to solid use of online banking services. Therefore, this study aims to identify the factors contributing to the Use of E-banking and analyze its impact on E-engagement through a combination of technology and service factors. Focusing on the case of NFC Bank, the study envisages answering the following questions: What are the drivers of E-banking applications? What is the impact of this use on customer E-engagement? To answer these questions, we developed a conceptual model that first examines the influence of E-banking technological features and service-related factors on Trust and Use. Next, we look at the impact of this use on Customer satisfaction and Usage continuance, components of E-engagement.

The remainder of the paper is organized as follows: Section 2 presents a literature review on E-banking adoption in developing countries. Section 3 highlights the conceptual framework of the research model and the hypotheses development. Section 4 develops the methodology used. Section 5 presents the main results, followed by discussions and implications in section 6. Limitations and directions for future research are presented in section 7, and finally, section 8 concludes.

2. Literature Review

2.1. E-Banking Adoption in Developing Countries

Launching the first Automated Teller Machine (ATM) in Finland marked the start of a new banking channel, making Finland the top country in E-banking before it became widely used in other developed and developing countries (Sharma, 2011; Fonseca, 2014). To this day, E-banking, or the delivery of financial services via electronic systems, continues to spread among customers due to banks' rapid improvement in information technology and marketing strategies. Table 1 below shows some definitions of the term "E-banking" emerging from the literature.

In recent years, the development and deployment of Internet banking have transformed delivering of banking services to consumers. The Internet allows

Table 1. Some definitions of E-banking.

Date Author	Definitions
2004 (Pikkarainen et al., 2004)	Electronic banking is a portal through which customers can use various banking services such as bill payments and investments via the internet (internet banking).
2004 (Lustsik, 2004)	E-banking services refer to various e-channels for conducting banking transactions using the Internet, telephone, mobile, and computer.
2006 (Pikkarainen et al., 2006)	E-banking is an electronic system connecting banks and their customers, facilitating the preparation, management, and control of financial transactions through transferring information.
2009 (Nyangosi et al., 2009)	Electronic banking is the availability of information and services by banks to customers through computers or television.
2014 (Awara & Anyadighibe, 2014)	E-banking is a technology that allows customers of financial institutions, whether individuals or companies, to access accounts, make transactions, or obtain information on financial products and services through a public and private network.
2016 (Jindal, 2016)	E-banking is the automated delivery of new and traditional banking products and services directly to customers through interactive electronic communication channels.
2016 (Offei & Nuamah-Gyambrah, 2016)	E-banking is the use of internet and telecommunication networks to deliver a wide range of value-added products and services to bank customers through a system that allows individuals to perform banking activities at home or from their offices, or over the internet.
2019 (Chedrawi et al., 2019)	E-banking is an electronic service that covers a wide range of banking transactions without the customer having to go to the branch.
2020 (Wondwossen & Dhiraj, 2020)	E-finance (E-banking) refers to delivering financial services through electronic media like personal computers, mobile phones, machines, and other devices using remote access connections, the internet, and messages.
2021 (Khan et al., 2021)	E-banking is a service that requests the use of specific communication tools. It encompasses phone banking, mobile banking, home banking, Internet banking, and mail banking.

banks to better meet customer needs through enhanced interaction, data mining, and customization (Raza et al., 2015; Liang & Nguyen, 2018). In addition, banks seek to lower their costs and, at the same time, increase their revenue by attracting consumers to use Internet banking. On the other hand, consumers enjoy the comfort of carrying out banking operations regardless of time and place (Talwar et al., 2020).

Introducing new technologies has become essential for developing the banking sector in the world, particularly in developing countries. With the rise of the internet and the acquisition of mobile phones by a large part of the population, especially in Africa, electronic financial services have become a valuable service offer for customers. Faced with this challenge, banks have made considerable investments in the strategic deployment of the online banking platform. They have created great competition between banks (Hammoud et al., 2018).

E-banking in developing countries has met several challenges, including 1) the ability to adopt technologies that require adequate infrastructure and practical

technical expertise; 2) the ability to provide an institutional and regulatory framework that ensures customer protection; and 3) the ability to lead small and medium-sized enterprises in the adoption of E-banking (Rupa Rege, 2003; Drigă & Isac, 2014). The applicability of these challenges has been more effective with the impact of e-commerce, which has motivated banks to implement E-banking for customer needs (Nikolina et al., 2021). Different authors have somewhat investigated the adoption of E-banking by customers in developing countries. They mainly conclude that E-banking services must be adapted to meet the desires and security of customers but also serve as an incentive for customers to engage in broader use. Similarly, banks must be able to anticipate market changes and invest more in E-banking as it positively affects profitability and bank growth in developing countries (Siddik et al., 2016).

2.2. E-Banking in Cameroonian Context

Cameroon effectively led the reform of its banking sector after the financial crisis and devaluation of the XAF (Central African CFA Franc) currency in 1994 (Tangakou & Mba, 2015; Kuikeu, 2021). According to COBAC (2018), with a population of more than 25 million inhabitants, sharing French and English as official languages, Cameroon alone has 47% of the banking network of the Economic and Monetary Community of Central Africa (CEMAC).[1] Moreover, the creation of national banks helps supporting the country's financial system following the failure of some foreign banking institutions after the crisis. We can cite bank institutions such as CCEI Bank (*Caisse Communautaire d'Épargne et d'Investissement*, now Afriland First Bank) in 1987 and NFC bank in 1989 (formerly *National Financial Credit Company*).

With an internet penetration rate of 30% by January 2020 (IAC, 2020), pioneering initiatives such as E-banking is an integral part of Cameroon's enhanced banking offerings. For the specific case of NFC Bank, the services offered (NFC, 2021) are presented in Table 2.

Regarding E-banking in Cameroon, studies have focused on customer perception and bank performance. Fonjai (2017) has shown that perceived reliability, trust, security, and accessibility significantly impact the perceived usefulness of E-banking adoption. It argues that banks need to increase E-banking security, accessibility, and trustworthiness and reduce the cost of E-banking services to encourage customers' attitudes towards adopting E-banking services. Fonchamnyo (2013), who extends the TAM model, shows that security, cost of services, trust, usefulness, and accessibility of services significantly influence customers' attitudes and adoption of E-banking. In the same vein, Tamajong (2020) concluded that many users complain about security and privacy, although they trust the service. Moreover, accessibility, convenience, and perceived ease of use motivate the acceptance of E-banking. Beloke et al. (2021) studied 10 of the 15

---

[1]CEMAC is composed of six countries: Cameroon, Central African Republic, Congo, Gabon, Equatorial Guinea and Chad.

Table 2. NFC Bank E-banking services.

NFC E-banking products	Services proposed
NFC Online banking NFC Mobile banking app NFC Bank debit card	• Account to account transfers; • Account to Mobile Money transfer; • Bill payments; • Balance details and last 10 transactions; • Checks and debit card-related activities; • Stop check payments when they are lost or stolen; • Block missing or stolen cards; • Consultation of the loan repayment situation; airtime and data purchase; • Send, receive and request money on the spot; • Cash backlog at ATMs.

banks in Cameroon to examine how transactions via digital services affect bank performance. They point out that these services have a significant influence on the profitability of commercial banks.

This research complements existing studies by focusing on the customer of a specific bank. In addition, by proposing a research model based on the most salient factors of E-banking usage, the study also examines the effect of E-banking usage on consumer E-engagement.

3. Conceptual Background and Hypotheses Development

The growth of Internet-based services has stimulated many fraudulent practices that take advantage of some of the technology's shortcomings (Abreu et al., 2016). These illicit practices have been most prevalent in the e-commerce sector (Carta et al., 2019), exposing users to various types of risk (identity theft, privacy violation, theft, fraud). Studies have shown that essential technological factors for recurrent use of technology are those capable of covering the risk associated with the use and providing security to the user (Sandal et al., 2020; Diniz et al., 2021). Therefore, when people use online services, such as E-banking, factors that undermine their confidence and willingness to use the service repeatedly become a threat (Emad & Hanan, 2017).

On the other hand, research shows that customers develop a kind of dependency on using a product when their expectation meets reliability. This dependency depends on the offering of the services compared to other providers present in their evaluation grid (Arvidsson, 2014; Wei et al., 2016). In terms of online services, the studies also reveal that customers are susceptible to three facts: 1) the quality of the service provided to them (Prentice et al., 2019), 2) the time taken in the execution of the requested transaction or to the rendering of the requested information (Roy & Moorthi, 2017), and 3) the cost incurred in

the use of the service (Abu Elsamen, 2015).

In terms of user-related impact, the literature develops the concept of engagement. Indeed, engagement is an essential psychological concept that impacts the behavior of individuals (de Vreede et al., 2019). It refers to a long-term phenomenon (continuous engagement), especially with the digital evolution that makes the experiences between humans and technology faster and more engaging. It is a concept divided into three distinct phenomena: 1) emotional engagement, where individuals experience a positive psychological reaction or attachment to an activity or situation; 2) behavioral engagement, where individuals make efforts or show persistence to stay involved in an activity; and 3) cognitive engagement, where individuals are cognitively absorbed in a task or activity (Ganeh Badrabad & Ghanizadeh, 2019; Hepola et al., 2020). Engagement is a significant marketing factor in online services, ensuring a competitive advantage. In this context, E-engagement corresponds to the intensity with which a customer becomes an active user and develops an attachment to the service they use via the internet or information technology (Promtep et al., 2019). Some researchers define E-engagement in terms of satisfaction (Yu & Ramaprasad, 2019), a form of emotional engagement, while others recognize it as a prerequisite for the success of online services as users display a high level of intention to continue using (Chiu et al., 2019).

Based on this development, **Figure 1** highlights the research model that presents technological features such as Perceived personal information protection and Perceived transaction security, as well as service-related factors such as Perceived time saving, Service quality, and Perceived cost saving. These factors
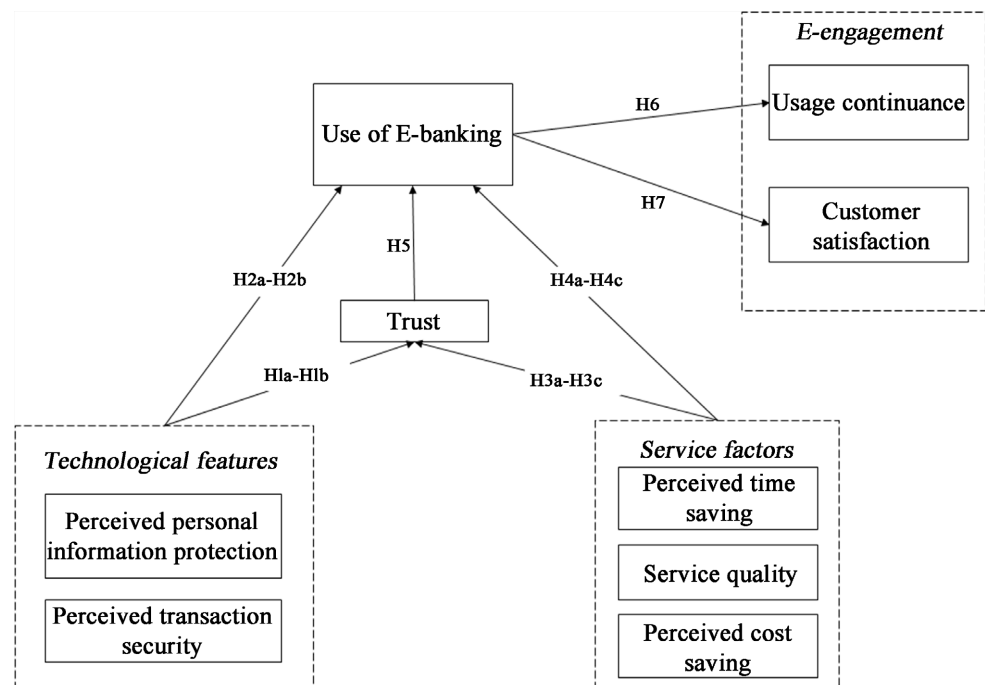

Figure 1. Research model.

explain Trust and Use of E-banking in this study. Finally, Use of E-banking explains the impact on E-engagement in terms of Customer satisfaction and Usage continuance.

3.1. Technological Features, Trust and Use of E-Banking Services

Perceived personal information protection

Customers who conduct financial transactions online may face all kinds of uncertainties and risks. In this case, the bank must adopt a sufficient information protection culture to comply with data privacy requirements (Da Veiga & Martins, 2015). This measure implies that the bank must be able to reassure customers about the level of provision made to avoid exposure to risk (Makarević et al., 2014). So, when customers have a high level of assurance about their personal information, they feel they have more control over online transactions. They pay attention primarily to those related to electronic transactions whose information should not be disclosed, viewed, stored or manipulated by inappropriate parties during their interaction with a system. This requirement increases their use level (Hodjat & Saba, 2017; Fei et al., 2018). Conversely, if the bank lacks to fulfil privacy, customers lose confidence and may abandon the use of the service. Either, we enounce the following hypotheses:

Hypothesis 1a. Perceived personal information protection has a positive influence on users' trust in E-banking.

Hypothesis 2a. Perceived personal information protection has a positive influence on the use of E-banking.

Perceived transaction security

The development of digital technologies in the banking field implies the implementation of mechanisms focused on security (Mwiya et al., 2017). As the level of control of the technology does not belong to the user, the person relies on the measures provided to him, such as authentication, passwords, and confidentiality clauses (Zimmermann & Gerber, 2020). Nevertheless, an user of E-banking only has the guarantee of excellent security practices from the service provider. Customers' Perceived transaction security is therefore a essential factor that depends on the user experience. Nowadays, customers are more interested in security regarding online transactions. If incongruities appear during the use, then they influence their confidence and their effective use. Therefore, we propose the following hypotheses:

Hypothesis 1b. Perceived transaction security has a positive influence on users' trust in E-banking.

Hypothesis 2b. Perceived transaction security has a positive influence on the use of E-banking.

3.2. Services Factors, Trust and Use of E-Banking Services

Perceived time saving

Consumers derive utility value from fast and efficient service delivery (Ngina,

2016). This situation concerns mobile devices, allowing consumers to gather information and conduct transactions anytime and anywhere (de Sousa & Sandro, 2014; Günther & Bernd, 2015). The faster and easier access to internet banking is, the more impact it has on users' daily routines and activities. This ubiquity in using E-banking in the service evaluation signals credibility and the establishment of effective trust (Baolin et al., 2017). Hence the following hypotheses are put forward:

Hypothesis 3a. Perceived time saving has a positive influence on users' trust in E-banking.

Hypothesis 4a. Perceived time saving has a positive influence on the use of E-banking.

Service quality

Service quality is a crucial variable for measuring success. It indicates the information system's ability to meet the user's different needs (Delone & McLean, 2003). With the Internet, customers can compare various services and make decisions quickly. So, an electronic service such as E-banking with good quality harmonizes the relationship between customers and the achievement of business objectives necessary to obtain a competitive advantage, especially in the banking sector (Rashid et al., 2019). As a result, we propose the following hypotheses:

Hypothesis 3b. Service quality has a positive influence on users' trust in E-banking.

Hypothesis 4b. Service quality has a positive influence on the use of E-banking.

Perceived cost saving

According to Anouze and Alamro (2020), cost includes the typical costs associated with internet use and bank fees. Perceived cost saving is one of the essential factors in adopting online services (Yang et al., 2016). Customers always expect the cost of transactions to be low. So, a recurrent variation in costs leading them to additional monetary expenses can reduce the influence on the usage behavior and the trust they have attributed to the service (Nguyen & Khoa, 2019). We, therefore, put the following hypotheses forward:

Hypothesis 3c. Perceived cost saving has a positive influence on users' trust in E-banking.

Hypothesis 4c. Perceived cost saving has a positive influence on the use of E-banking.

3.3. Trust and Use of E-Banking Services

Trust is a critical element in using technologies (Siau & Wang, 2018). In the E-banking literature, it is a challenge as it builds a long-term relationship between the bank and its customers. When customers believe the bank is trustworthy and will act in their interests, they are willing to carry out transactions via the medium provided, expecting the bank to fulfil its monitoring and control obligations (Yu et al., 2015). We, therefore, enounce the following hypothesis:

Hypothesis 5. Trust has a positive influence on the use of E-banking.

3.4. Use and Customer E-Engagement

Usage continuance

Usage continuance reveals the success of products or services with customers. The more they use the service, the more they develop an attachment to using it soon. Therefore, with the experience and continuous measurement of the product according to their expectations over time, they display a behavior that is a psychological attachment to the E-banking service offered by the bank (Yasin et al., 2020). This attachment, which can be considered loyalty, stimulates an expression of commitment to continue using E-banking (Chaouali et al., 2016; Thakur, 2019). Therefore, we propose the following hypothesis:

Hypothesis 6. Use of E-banking has a positive impact on Usage continuance.

Customer satisfaction

Khatoon et al. (2020) defined customer satisfaction as the consumer's response to the evaluation of the perceived difference between expectations and performance following consumption. Satisfaction is crucial because it implies the willingness to repeat the action of using the service (Izogo & Ogba, 2015). Meeting customers' needs and expectations reveals a favorable acceptance of the service offered by the bank. This acceptance, combined with the recurrent use of the service, is a sign of satisfaction. Therefore, we propose the following hypothesis:

Hypothesis 7. Use of E-banking has a positive impact on customer satisfaction.

4. Methodology

4.1. Data Collection

For the data collection phase, a questionnaire was developed based on a review of the existing literature. The design principle of the questionnaire is to look for items for each construct provided by studies that have already explored them in their analysis. Because these items are already confirmed in the literature as being reliable for quantitative analyses, we identified and selected some of them and adapted them to our study. **Appendix A** presents these measurement items and the references of the studies to which they were adapted. We use thirty-seven (37) items to measure the nine (09) research model's constructs. A 7-point Likert scale—ranging from "completely disagree" to "completely agree"—serves as a measurement of each item. In order to determine if the questionnaire is understandable, well-structured and not open to other interpretations, it is important to conduct a pre-test before collecting the data. To do this, we used a sample of sixteen (16) people, composed of students and banking professionals. Their role was to read the questionnaire and check for errors, incomprehensible sentences and inconsistent organization of the questionnaire. From them, we received positive feedback which confirms that the questionnaire is reliable and understand-

able, without any ambiguity. Afterwards, we determined our minimum sample size.

By inserting parameters such as effect size, probability error, the power of the effect, and the number of predictors or latent explanatory variables, it is possible to obtain the sample size necessary to test the model effectively. For this study, we determine the minimum sample size through the GPower 3.1.9.2 software, which has the particularity of calculating the statistical power for various statistical tests (Kang, 2015). With a total of seven (07) predictors, a probability of error α = 0.05, an effect power $(1 - \beta)$ = 0.80, and an effect size of f^2 = 0.15, the minimum total sample size is one hundred and three (103) individuals.

After designing the questionnaire, we have made a Google Forms version intending to reach a large majority of users via their smartphones or computers. Before we proceed to massive data collection, we first collect a sample of 50 responses from our target population to conduct a pilot test. The purpose of the pilot test is to ensure that the measurement items are statistically reliable and valid in order to guarantee the stability of the model. If the pilot test shows that certain measurement items have a low value of some measurement criteria such as outer loading according to the PLS-SEM methodology, they should be removed from the questionnaire. Thus, after conducting the pilot test, we found that all measurement items met the recommended thresholds. Thus, we began the collection in a broader way.

In collaboration with the E-banking department of NFC Bank, the online questionnaire was sent via WhatsApp and via email to E-banking products' customers, as they rarely come to bank branches. An introduction at the beginning of the questionnaire guides the respondents of the survey. This text introduces them to the study's purpose, the anonymity of the questionnaire, and the use of the data strictly for academic research purposes.

Additionally, definitions of each construct permit a better understanding of each item of the questionnaire. At the end of this collection, which took place from October to November 2020, we retained 346 responses for the analyses. Table 3 presents the demographic profiles of the respondents. This demographic representation shows the repartition of our target respondents by gender, age, level education, occupation and E-banking experience. We noticed that the data is predominantly represented by men and women, people between the ages of 18 and 35, people with higher education, people working in the private sector, and those with one to three years of E-banking experience.

4.2. Data Analysis

This study used the partial least square-structural equation modeling (PLS-SEM) to analyze the model. We use SmartPLS version 3.3.9 (Ringle et al., 2015) to perform the data analysis. This method is quite relevant for understanding the behavior of individuals, especially in evaluating complex causal relationships. It is a well-known method widely used in research conducted in a variety of fields

Table 3. Demographic profile.

Profile	Description	Frequency	Percentage
Gender	Male	180	52.02%
	Female	166	47.98%
Age	14 - 18	2	0.58%
	18 - 25	138	39.88%
	26 - 35	128	36.99%
	36 - 45	44	12.72%
	46 - 60	30	8.67%
	60 and above	4	1.16%
Level of education	No qualification	1	0.29%
	Primary school	15	4.34%
	Secondary school	5	1.45%
	Undergraduate	14	4.05%
	Graduate	118	34.10%
	Postgraduate	193	55.78%
Occupation	Private Sector	235	67.92%
	Public sector	19	5.49%
	Semi-private sector	25	7.23%
	Self-employment	67	19.36%
E-banking experience	Less than a year	86	24.86%
	Between one and three years	146	42.20%
	More than three years	114	32.95%

of management science (Hair Jr. et al., 2014; Khan et al., 2019), including information systems (Hair et al., 2017; Foka Nzaha et al., 2022), marketing (Arvidsson, 2014; Liang & Nguyen, 2018), management (Gadedjisso-Tossou et al., 2022), finance (Siddik et al., 2016; Avkiran, 2018; Ndassi Teutio et al., 2021), to name few. We proceed in two steps to assess the relevance of the results. The first step evaluates the measurement model to attest to the reliability and validity of the constructs. The second one considers the structural model through the validity of the relationships (hypotheses) between the constructs (Hair et al., 2019).

5. Results

5.1. Assessment of Measurement Model

Table 4 below shows the values of outer loading, rho_A, composite reliability (CR), and the average variance extracted (AVE) obtained after running the PLS algorithm in SmartPLS 3. According to Hair Jr. et al. (2016), the values of the

Table 4. Construct's validity and reliability.

Constructs	Items	Outer loading	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Use of E-banking	US1	0.904				
	US2	0.853	0.885	0.891	0.929	0.813
	US3	0.946				
Customer satisfaction	CS1	0.901				
	CS3	0.935	0.909	0.910	0.943	0.847
	CS4	0.924				
Perceived cost saving	PC1	0.910				
	PC2	0.931	0.896	0.896	0.935	0.827
	PC4	0.888				
Perceived time saving	PT1	0.920				
	PT3	0.942	0.919	0.924	0.949	0.860
	PT4	0.921				
Perceived personal information protection	PI1	0.909				
	PI2	0.903	0.781	0.782	0.901	0.821
Service quality	SQ1	0.858				
	SQ2	0.918				
	SQ3	0.870	0.901	0.903	0.927	0.718
	SQ4	0.823				
	SQ5	0.760				
Trust	TR2	0.787				
	TR3	0.855	0.807	0.824	0.886	0.723
	TR4	0.904				
Perceived transaction security	TS1	0.837				
	TS5	0.886	0.656	0.668	0.853	0.743
Usage continuance	UC1	0.920				
	UC3	0.899	0.906	0.906	0.941	0.842
	UC4	0.933				

outer loading of each item, the value of Cronbach's alpha, rho_A, and the composite reliability (CR) determine the internal consistency reliability. They must all be greater than 0.7. The AVE gives the convergent validity of the model, which must be greater than 0.5. Based on these criteria, we find that most items have values greater than 0.7. We deleted the items CS2, PC3, PT2, TR1, TS2, and

UC2 because they have low values. The internal reliability criteria also meet the threshold of 0.7 except for the construct "Perceived transaction security", which has a value of Cronbach's alpha and rho_A close to 0.7. We preserve this construct due to its good composite reliability and AVE level. We also deleted the items PI3, PI4, TS3, and TS4 to correct the correlations between "Perceived personal information protection" and "Perceived transaction security".

In addition to internal reliability and convergent validity, it is essential to test the discriminant validity. We chose the Fornell-Lacker criterion which suggest that the square root of the AVEs, along with the diagonal, must be greater than all the values below and left (Fornell & Larcker, 1981). Table 5 presents the correlation matrix according to the Fornell-Lacker criterion. It indicates the extent to which each of the constructs in the research model is unique and different from other constructs (Dutot et al., 2019). Concerning this result, we conclude that the discriminant validity is not an issue in this research model.

5.2. Assessment of Structural Model

The evaluation of the structural model requires first the analysis of the coefficient of determination (R^2), which is a measure of the model's explanatory power. The R^2 measures the variance explained in each of the endogenous constructs. R^2 values of 0.75, 0.50, and 0.25 are considered substantial, moderate, and weak (Hair Jr. et al., 2016; Hair et al., 2019). Table 6 shows that the Use of E-banking is explained at 39.6% ($R^2 = 0.396$), that Trust is explained at 61.5% ($R^2 = 0.615$) and finally, that the Use of E-banking explains Customer satisfaction at 48% ($R^2 = 0.480$) and Usage continuance at 60.3% ($R^2 = 0.603$).

We perform the blindfolding procedure to get the Q^2 values to evaluate the accuracy of the predictive model. Unlike the R^2 value, which indicates the

Table 5. Discriminant validity - Fornell-Larcker Criterion.

	US	CS	PC	PT	PI	SQ	TS	TR	UC
US	**0.902**								
CS	0.692	**0.920**							
PC	0.500	0.608	**0.910**						
PT	0.529	0.599	0.582	**0.928**					
PI	0.350	0.454	0.637	0.524	**0.906**				
SQ	0.586	0.627	0.667	0.726	0.547	**0.847**			
TS	0.498	0.598	0.719	0.618	0.788	0.690	**0.862**		
TR	0.492	0.502	0.626	0.693	0.625	0.683	0.652	**0.850**	
UC	0.777	0.748	0.536	0.656	0.423	0.611	0.562	0.605	**0.917**

US = Use of E-banking; CS = Customer satisfaction; PC = Perceived cost saving; PT = Perceived time saving; PI = Perceived personal information protection; SQ = Service quality; TS = Perceived transaction security; TR = Trust; UC = Usage continuance.

in-sample explanatory power of the model, the Q^2 value reveals his predictive accuracy. The Q^2 values must be greater than 0 for low predictive accuracy, greater than 0.25 for medium predictive accuracy, and greater than 0.50 for highly predictive accuracy (Hair et al., 2019). Table 6 reports the Q^2 values of the endogenous constructs of our research model. It shows that Use of E-banking ($Q^2 = 0.310$), Customer satisfaction ($Q^2 = 0.398$) and Trust ($Q^2 = 0.436$) have a medium predictive accuracy. Usage continuance, on the other hand ($Q^2 = 0.503$), has a large predictive accuracy.

We use the bootstrapping method to test the hypotheses of the research model. Table 7 shows the different relationships constituting each of the hypotheses and their level of significance. The results show eleven accepted hypotheses and

Table 6. R^2 and Q^2 values.

Dependent constructs	R^2	R^2 Adjusted	Interpretation	Q^2	Interpretation
Use of E-banking	0.396	0.385	Weak	0.310	Medium
Customer satisfaction	0.480	0.478	Weak	0.398	Medium
Trust	0.615	0.610	Moderate	0.436	Medium
Usage continuance	0.603	0.602	Moderate	0.503	Large

Table 7. Hypotheses testing.

Hypotheses		Original Sample (β)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|β/STDEV|)	P Values	Sign. Level	Results
H1a	PI -> TR	0.237	0.240	0.063	3.743	0.000	****	Accepted
H2a	PI -> US	−0.184	−0.179	0.068	2.685	0.007	***	Accepted
H1b	TS -> TR	0.028	0.029	0.085	0.325	0.745	n.s	Rejected
H2b	TS -> US	0.185	0.185	0.083	2.225	0.026	**	Accepted
H3a	PT -> TR	0.323	0.320	0.052	6.266	0.000	****	Accepted
H4a	PT -> US	0.155	0.150	0.071	2.165	0.030	**	Accepted
H3b	SQ -> TR	0.218	0.220	0.059	3.702	0.000	****	Accepted
H4b	SQ -> US	0.288	0.291	0.070	4.118	0.000	****	Accepted
H3c	PC -> TR	0.122	0.118	0.055	2.219	0.027	**	Accepted
H4c	PC -> US	0.144	0.142	0.078	1.850	0.064	*	Accepted
H5	TR -> US	0.092	0.091	0.074	1.250	0.211	n.s	Rejected
H6	US -> UC	0.777	0.776	0.028	27.648	0.000	****	Accepted
H7	US -> CS	0.692	0.692	0.036	19.449	0.000	****	Accepted

****$p < 0.001$; ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$; n.s. not significant; US = Use of E-banking; CS = Customer satisfaction; PC = Perceived cost saving; PT = Perceived time saving; PI = Perceived personal information protection; SQ = Service quality; TS = Perceived transaction security; TR = Trust; UC = Usage continuance.

two rejected hypotheses. Perceived personal information protection ($\beta = -0.184$; $p < 0.01$), Perceived transaction security ($\beta = 0.185$; $p < 0.05$), Perceived time saving ($\beta = 0.155$; $p < 0.05$), Service quality ($\beta = 0.288$; $p < 0.001$) and Perceived cost saving ($\beta = 0.144$; $p < 0.1$) significantly influence the Use of E-banking. On the other hand, Trust is significantly influenced by Perceived personal information protection ($\beta = 0.237$; $p < 0.001$), Perceived time saving ($\beta = 0.323$; $p < 0.001$), Service quality ($\beta = 0.218$; $p < 0.001$) and Perceived cost saving ($\beta = 0.122$; $p < 0.05$) apart from Perceived transaction security ($\beta = 0.028$; $p = 0.745$). Finally, the results also show that Use of E-banking significantly impacts Usage continuance ($\beta = 0.777$; $p < 0.001$) and Customer satisfaction ($\beta = 0.692$; $p < 0.001$). Figure 2 presents the estimation results of the structural model.

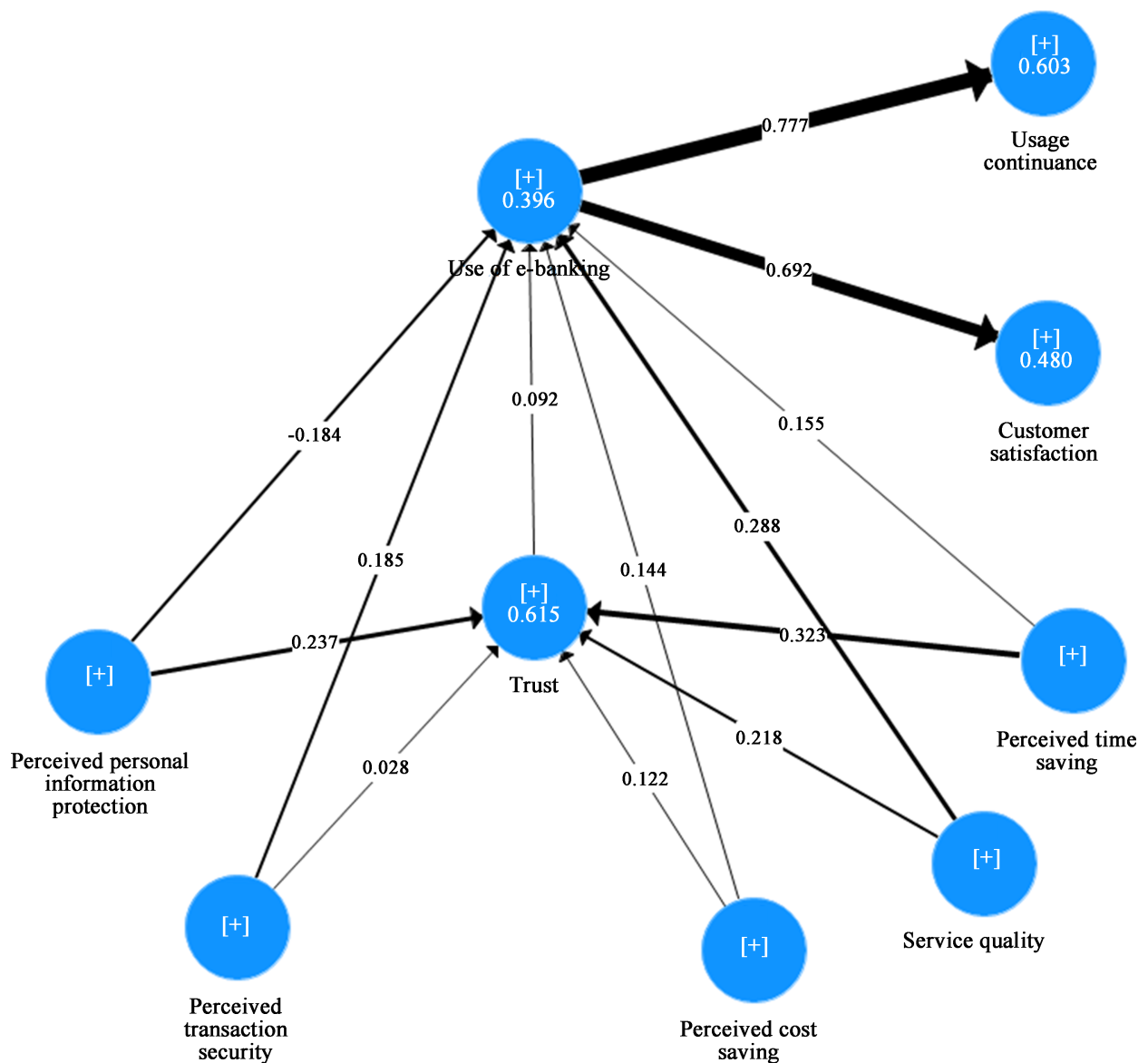Table 8 presents the specific indirect effects of the relationships between the

Figure 2. Result of model estimation and highlight paths.

Table 8. Mediation's analysis.

Construct relationship	Original Sample (β)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|β/STDEV|)	P Values	Sign. Level	Results
PI -> TR -> US	0.022	0.021	0.018	1.207	0.227	n.s	No mediation
TS -> TR -> US	0.003	0.004	0.010	0.245	0.806	n.s	No mediation
PT -> TR -> US	0.030	0.030	0.025	1.187	0.235	n.s	No mediation
SQ-> TR -> US	0.020	0.020	0.017	1.158	0.247	n.s	No mediation
PC -> TR -> US	0.011	0.011	0.011	1.066	0.287	n.s	No mediation

****$p < 0.001$; ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$; n.s. not significant; US = Use of E-banking; CS = Customer satisfaction; PC = Perceived cost saving; PT = Perceived time saving; PI = Perceived personal information protection; SQ = Service quality; TS = Perceived transaction security; TR = Trust; UC = Usage continuance.

constructs in the model. The results show that there are no mediating effects between technology features, service factors and Trust.

6. Discussion and Implications

6.1. Discussion

The technological features highlighted in this study are Perceived personal information protection and Perceived transaction security. The results show that the assurance of information confidentiality that the bank provides to its customers strongly influences the Use of E-banking. However, although this affects Trust, customers are still somewhat reticent about the security of transactions offered by the bank. Therefore, they do not completely trust the bank and believe monetary loss or fraud is possible. They think their confidential information is protected, although risks may occur during their transacting sessions. These results are consistent with those of Damghanian et al. (2016), Ataya and Ali (2019), and Nguyen and Huynh (2018).

The service factors highlighted in this study are Perceived time-saving, Service quality, and Perceived cost saving. The results show that all these factors influence Trust and Use of E-banking. They also show that quality of service is the factor that most strengthens customer confidence and leads them to use E-banking services (Masoud & AbuTaqa, 2017; Pambudi et al., 2021). The results are also somewhat surprising in that the perception of time-saving influences Trust more than Use of E-banking. It seems that customers trust the bank's E-banking when it meets their immediate needs while providing a quality service at a lower cost. Although this trust does not directly influence their use, there are still considerations to be made on its fundamental importance in the Use of E-banking (Bahmanziari et al., 2003; Lăzăroiu et al., 2020).

Indeed, the results show that Trust does not act as a mediating effect leading to Use of E-banking. We can explain this because, although digital banking solu-

tions exist, customers are still strongly present in bank branches to carry out their operations. As a result, despite their experience in using E-banking, they have not yet sufficiently developed a behavior that leads them to use it repeatedly. Therefore, E-banking is still an intermediate solution to the bank branch. Hence, customers may have a high level of confidence in E-banking but a low or medium level of use.

Finally, the results reveal rather good E-engagement behavior of NFC Bank customers. This result shows that E-banking usage has strongly increased consumer' E-engagement (Thakur, 2016). Use of E-banking has a significant impact on Usage continuance and Customer satisfaction.

6.2. Implications

Theoretical implications

This study makes three overarching contributions to the E-banking literature: First, it identifies and confirms the critical place of trust in E-banking in developing countries (Vaidya, 2016). The results show that customers positively perceive E-banking, but Trust does not necessarily imply high usage of E-banking.

Second, the study highlights the concept of E-engagement by focusing on aspects related to Customer satisfaction and Usage continuance. We thus demonstrate that banking customers have a high level of E-engagement with E-banking products. These results complete the studies on E-engagement and contribute to the non-existent literature on its link to E-banking.

Third, this study contributes to understanding the Use of E-banking in developing countries, particularly in Central Africa, with Cameroon's example. As Cameroon is the pioneer economy in the Central African zone, the study provides an essential key to understanding the behavior of individuals in this zone. The results can be used to explore similar contexts or be compared to others.

Managerial implications

This study provides some managerial and practical implications. There is already evidence that E-banking meets customer needs. However, banks need to inform customers about risk management policies concerning transaction security to build trust. Banks must set up alert processes or informative sections within the applications that highlight regulations and security requirements.

Banks also need to consider customer trust while developing strategies that will drive customers to adopt further the digital channels that the bank offers. Banks must therefore motivate their offer by lowering the cost of accessing their services. Bank managers can conduct surveys or evaluations to assess, at given periods, customers' opinions on the evolution of electronic banking offerings.

Bank managers should consider the influence of the changing environment on customers. The E-engagement of customers in using E-banking could encourage them to recommend and talk about the products they use. Thus, to enhance the attractiveness of E-banking platforms, they need to consider the image they give off to the public and the effect of word-of-mouth value among users (Shankar et al., 2020).

7. Limitations and Future Research

This study has some functional limitations that command future research. First, this research focused on NFC Bank customers. We encourage future studies to expand the research by conducting comparative analyses across banks. It may be helpful to know if there is a significant difference between the offerings to discern their strategic and commercial relevance to the banking sector in Central Africa. Second, a qualitative study is necessary to understand whether the results achieved are a consequence of the bank's strategic actions and how it plans to improve its offering and build customer confidence. Thus, we encourage future studies to take a qualitative approach to capture the views of the bank's managers. We also encourage further exploration of E-engagement by adding other components to the E-banking literature. Finally, an analysis by gender and level of experience in E-banking could have provided a more specific understanding of the topic.

8. Conclusion

This study examined how technological features (Perceived personal information protection and Perceived transaction security), service factors (Perceived time saving, Service quality, and Perceived cost saving), and Trust influence Use of E-banking and how this affects E-engagement through Customer satisfaction and Usage continuance. The study shows that Trust is strongly influenced by Perceived personal information protection and the service factors (Perceived time saving, Service quality, and Perceived cost saving). However, Trust in E-banking does not necessarily lead to its Use. On the other hand, Use of E-banking influenced by both technological features of electronic financial services (Perceived personal information protection, Perceived transaction security) and service factors (Perceived time saving, Service quality, and Perceived cost saving).

This research contributes to the literature by developing a model that integrates the main drivers of Use of E-banking developed in the literature and adapts it to a specific context in developing countries such as Cameroon. The limitations it identifies will help encourage other researchers to explore other avenues of analysis to understand E-banking adoption better. It also provides practical implications for banks to improve their marketing and customer relations approach.

Acknowledgements

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Abreu, R., David, F., & Segura, L. (2016). E-Banking Services: Why Fraud Is Important? *Journal of Information Systems Engineering & Management, 1,* 111-121. https://doi.org/10.20897/lectito.201617

Abu Elsamen, A. A. (2015). Online Service Quality and Brand Equity: The Mediational Roles of Perceived Value and Customer Satisfaction. *Journal of Internet Commerce, 14,* 509-530. https://doi.org/10.1080/15332861.2015.1109987

Adapa, S., & Roy, S. K. (2017). Consumers' Post-Adoption Behaviour towards Internet Banking: Empirical Evidence from Australia. *Behaviour & Information Technology, 36,* 970-983. https://doi.org/10.1080/0144929X.2017.1319498

Al-Shbiel, S. O., & Ahmad, M. A. (2016). A Theoretical Discussion of Electronic Banking in Jordan by Integrating Technology Acceptance Model and Theory of Planned Behavior. *International Journal of Academic Research in Accounting, Finance and Management Sciences, 6,* 272-284. https://doi.org/10.6007/IJARAFMS/v6-i3/2275

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and Creativity in Organizations: A State-of-the-Science Review, Prospective Commentary, and Guiding Framework. *Journal of Management, 40,* 1297-1333. https://doi.org/10.1177/0149206314527128

Anouze, A. L. M., & Alamro, A. S. (2020). Factors Affecting Intention to Use E-Banking in Jordan. *International Journal of Bank Marketing, 38,* 86-112. https://doi.org/10.1108/IJBM-10-2018-0271

Arvidsson, N. (2014). Consumer Attitudes on Mobile Payment Services—Results from a Proof of Concept Test. *International Journal of Bank Marketing, 32,* 150-170. https://doi.org/10.1108/IJBM-05-2013-0048

Ataya, M. A. M., & Ali, M. A. M. (2019). Acceptance of Website Security on E-Banking. A Review. In *2019 IEEE 10th Control and System Graduate Research Colloquium (ICSGRC)* (pp. 201-206). IEEE. https://doi.org/10.1109/ICSGRC.2019.8837070

Avkiran, N. K. (2018). Measuring the Systemic Risk of Regional Banks in Japan with PLS-SEM. *Theoretical Economics Letters, 8,* 2024-2037. https://doi.org/10.4236/tel.2018.811132

Awara, N. F., & Anyadighibe, J. A. (2014). Factors Influencing Banks' Implementation and Consumers' Acceptance of E-Banking of Selected Commercial Banks in Calabar, Cross River State, Nigeria. *International Journal of Managerial Studies and Research, 2,* 1-13.

Bahmanziari, T., Pearson, J. M., & Crosby, L. (2003). Is Trust Important in Technology Adoption? A Policy Capturing Approach. *Journal of Computer Information Systems, 43,* 46-54.

Baolin, S., Chaohao, S., Chang, L., & Chao, G. (2017). Research on Initial Trust Model of Mobile Banking Users. *Journal of Risk Analysis and Crisis Response, 7,* 13-20. https://doi.org/10.2991/jrarc.2017.7.1.2

Beloke, N., Messomo, E., & Mbu, S. (2021). The Influence of Digital Financial Services on the Financial Performance of Commercial Banks in Cameroon. *European Scientific Journal ESJ, 17,* 1857-7881. https://doi.org/10.19044/esj.2021.v17n15p448

Boateng, H., Adam, D. R., Okoe, A. F., & Anning-Dorson, T. (2016). Assessing the Determinants of Internet Banking Adoption Intentions: A Social Cognitive Theory Perspective. *Computers in Human Behavior, 65,* 468-478. https://doi.org/10.1016/j.chb.2016.09.017

Carta, S., Fenu, G., Reforgiato Recupero, D., & Saia, R. (2019). Fraud Detection for

E-Commerce Transactions by Employing a Prudential Multiple Consensus Model. *Journal of Information Security and Applications, 46,* 13-22. https://doi.org/10.1016/j.jisa.2019.02.007

Chaouali, W., Ben Yahia, I., & Souiden, N. (2016). The Interplay of Counter-Conformity Motivation, Social Influence, and Trust in Customers' Intention to Adopt Internet Banking Services: The Case of an Emerging Country. *Journal of Retailing and Consumer Services, 28,* 209-218. https://doi.org/10.1016/j.jretconser.2015.10.007

Chedrawi, C., Harb, B., & Saleh, M. (2019). The E-Banking and the Adoption of Innovations from the Perspective of the Transactions Cost Theory: Case of the Largest Commercial Banks in Lebanon. In Y. Baghdadi, & A. Harfouche (Eds.), *ICT for a Better Life and a Better World: The Impact of Information and Communication Technologies on Organizations and Society* (pp. 149-164). Springer International Publishing. https://doi.org/10.1007/978-3-030-10737-6_10

Chiu, C.-K., Lin, C.-P., Chen, K.-J., Liu, C.-M., & Ma, H.-C. (2019). Modeling Continuance Intention towards Mobile Travel Service System (MTSS): A Theoretical Perspective of Motivation and Dependency. *Review of Managerial Science, 13,* 749-769. https://doi.org/10.1007/s11846-017-0257-9

Cho, J., & Lee, H. E. (2020). Post-Adoption Beliefs and Continuance Intention of Smart Device Use among People with Physical Disabilities. *Disability and Health Journal, 13,* Article ID: 100878. https://doi.org/10.1016/j.dhjo.2019.100878

COBAC (2018). *Rapport Annuel 2018 Commission Bancaire de l'Afrique Centrale.* http://www.sgcobac.org/upload/docs/application/pdf/2020-12/rapport_dactivite_de_la_cobac_2018.pdf

Da Veiga, A., & Martins, N. (2015). Information Security Culture and Information Protection Culture: A Validated Assessment Instrument. *Computer Law & Security Review, 31,* 243-256. https://doi.org/10.1016/j.clsr.2015.01.005

Damghanian, H., Zarei, A., & Siahsarani Kojuri, M. A. (2016). Impact of Perceived Security on Trust, Perceived Risk, and Acceptance of Online Banking in Iran. *Journal of Internet Commerce, 15,* 214-238. https://doi.org/10.1080/15332861.2016.1191052

de Sousa, B. M., & Sandro, A. G. (2014). Ubiquitous Technologies and the Emergence of New Learning Experiences. In N. F. M. Mendes (Ed.), *Technology Platform Innovations and Forthcoming Trends in Ubiquitous Learning* (pp. 142-159). IGI Global. https://doi.org/10.4018/978-1-4666-4542-4.ch008

de Vreede, T., Andel, S., de Vreede, G.-J., Spector, P., Singh, V., & Padmanabhan, B. (2019). What Is Engagement and How Do We Measure It? Toward a Domain Independent Definition and Scale. In *Proceedings of the 52nd Hawaii International Conference on System Sciences.* https://doi.org/10.24251/HICSS.2019.092

Deb, M., & Lomo-David, E. (2014). An Empirical Examination of Customers' Adoption of m-Banking in India. *Marketing Intelligence & Planning, 32,* 475-494. https://doi.org/10.1108/MIP-07-2013-0119

Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems, 19,* 9-30. https://doi.org/10.1080/07421222.2003.11045748

Demirguc-Kunt, A., Klapper, L. S., Dorothe, A. S., & Hess, J. (2018). *Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution.* World Bank. http://hdl.handle.net/10986/29510 https://doi.org/10.1596/978-1-4648-1259-0

Devi Juwaheer, T., Pudaruth, S., & Noyaux, M. M. E. (2012). Analysing the Impact of

Green Marketing Strategies on Consumer Purchasing Patterns in Mauritius. *World Journal of Entrepreneurship, Management and Sustainable Development, 8,* 36-59. https://doi.org/10.1108/20425961211221615

Diniz, F. R., Hohemberger, R., Konzen, M. P., & Temp, D. C. (2021). E-Banking Security: Threats, Challenges, Solutions, and Trends. In Information Resources Management Association (Ed.), *Research Anthology on Concepts, Applications, and Challenges of FinTech* (pp. 385-397). IGI Global. https://doi.org/10.4018/978-1-7998-8546-7.ch021

Drigă, I., & Isac, C. (2014). E-Banking Services—Features, Challenges and Benefits. *Annals of the University of Petrosani, Economics, 14,* 49-58.

Dutot, V., Bhatiasevi, V., & Bellallahom, N. (2019). Applying the Technology Acceptance Model in a Three Countries Study of Smartwatch Adoption. *The Journal of High Technology Management Research, 30,* 1-14.
https://doi.org/10.1016/j.hitech.2019.02.001

Emad, M., & Hanan, A. (2017). Factors Affecting Customers' Adoption of E-Banking Services in Jordan. *Information Resources Management Journal (IRMJ), 30,* 44-60.
https://doi.org/10.4018/IRMJ.2017040103

Fei, G., Pei-Luen Patrick, R., & Yubo, Z. (2018). Perceived Mobile Information Security and Adoption of Mobile Payment Services in China. In Information Resources Management Association (Ed.), *Mobile Commerce: Concepts, Methodologies, Tools, and Applications* (pp. 1179-1198). IGI Global.
https://doi.org/10.4018/978-1-5225-2599-8.ch055

Foka Nzaha, S., Kala Kamdjoug, J. R., & Ndassi Teutio, A. O. (2022). Exploring the Drivers of Cryptocurrency Adoption Intent in Africa. In A. Rocha, H. Adeli, G. Dzemyda, & F. Moreira (Eds.), W*orld Conference on Information Systems and Technologies* (pp. 394-403). Springer. https://doi.org/10.1007/978-3-031-04829-6_35

Fonchamnyo, D. C. (2013). Customers' Perception of E-Banking Adoption in Cameroon: An Empirical Assessment of an Extended TAM. *International Journal of Economics and Finance, 5,* 166-176.

Fonjai, M. (2017). *Customers' Perception on Utilization of E-Banking in Cameroon: Comparison between Cameroon and Finland.* Centria-ammattikorkeakoulu.
https://www.theseus.fi/handle/10024/136909

Fonseca, J. R. S. (2014). E-Banking Culture: A Comparison of EU 27 Countries and Portuguese Case in the EU 27 Retail Banking Context. *Journal of Retailing and Consumer Services, 21,* 708-716. https://doi.org/10.1016/j.jretconser.2014.05.006

Fornell, C., & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research, 18,* 382-388. https://doi.org/10.1177/002224378101800313

Gadedjisso-Tossou, A., Gueyie, J.-P., & Couchoro, M. K. (2022). Female Managers, Informal Enterprises, and Their Perceived Financial Performance in Togo. *Journal of African Business,* 1-27. https://doi.org/10.1080/15228916.2022.2070387

Ganeh Badrabad, L., & Ghanizadeh, A. (2019). The Impact of Visualization and Graphic Organizers on EFL Learners' Cognitive, Emotional, and Behavioral Engagement and Listening. *Journal of Language and Translation, 9,* 1-15.

Günther, S., & Bernd, R. (2015). Mobile Phones as Ubiquitous Social and Environmental Geo-Sensors. In Y. Zheng (Ed.), *Encyclopedia of Mobile Phone Behavior* (pp. 1194-1213). IGI Global. https://doi.org/10.4018/978-1-4666-8239-9.ch098

Gupta, A., Yousaf, A., & Mishra, A. (2020). How Pre-Adoption Expectancies Shape Post-Adoption Continuance Intentions: An Extended Expectation-Confirmation Model. *In-*

ternational Journal of Information Management, 52, Article ID: 102094.
https://doi.org/10.1016/j.ijinfomgt.2020.102094

Gupta, D., & Kamilla, U. (2014). Cyber Banking in India: A Cross-Sectional Analysis Using Structural Equation Model. IUP Journal of Bank Management, 13, 47-63.

Hair Jr., J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage Publications.

Hair Jr., J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial Least Squares Structural Equation Modeling (PLS-SEM). European Business Review, 26, 106-121.
https://doi.org/10.1108/EBR-10-2013-0128

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to Use and How to Report the Results of PLS-SEM. European Business Review, 31, 2-24.
https://doi.org/10.1108/EBR-11-2018-0203

Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An Updated and Expanded Assessment of PLS-SEM in Information Systems Research. Industrial Management & Data Systems, 117, 442-458. https://doi.org/10.1108/IMDS-04-2016-0130

Hammoud, J., Bizri, R. M., & El Baba, I. (2018). The Impact of E-Banking Service Quality on Customer Satisfaction: Evidence from the Lebanese Banking Sector. SAGE Open, 8.
https://doi.org/10.1177/2158244018790633

Hepola, J., Leppäniemi, M., & Karjaluoto, H. (2020). Is It All about Consumer Engagement? Explaining Continuance Intention for Utilitarian and Hedonic Service Consumption. Journal of Retailing and Consumer Services, 57, Article ID: 102232.
https://doi.org/10.1016/j.jretconser.2020.102232

Hodjat, H., & Saba, M. (2017). Analysis of Consideration of Security Parameters by Vendors on Trust and Customer Satisfaction in E-Commerce. Journal of Global Information Management (JGIM), 25, 32-45. https://doi.org/10.4018/JGIM.2017100103

Hua, X., Huang, Y., & Zheng, Y. (2019). Current Practices, New Insights, and Emerging Trends of Financial Technologies. Industrial Management & Data Systems, 119, 1401-1410. https://doi.org/10.1108/IMDS-08-2019-0431

IAC (2020). Le taux de pénétration de l'internet au Cameroun atteint 30% en 2020, grâce à l'arrivée de 570 000 nouveaux internautes. Investir Au Cameroun.
https://www.investiraucameroun.com/economie/2402-14084-le-taux-de-penetration-de-l-internet-au-cameroun-atteint-30-en-2020-grace-a-l-arrivee-de-570-000-nouveaux-internautes

Ismail, L. B., & Alawamleh, M. (2017). The Impact of Online Banking of Customer Satisfaction in Jordan. Journal of Organisational Studies and Innovation, 4, 1-13.

Izogo, E. E., & Ogba, I.-E. (2015). Service Quality, Customer Satisfaction and Loyalty in Automobile Repair Services Sector. International Journal of Quality & Reliability Management, 32, 250-269. https://doi.org/10.1108/IJQRM-05-2013-0075

Jindal, S. (2016). Study of E-Banking Scenario in India. International Journal of Science and Research (IJSR), 5, 680-683.

Kala Kamdjoug, J. R., Wamba-Taguimdje, S.-L., Wamba, S. F., & Kake, I. B. (2021). Determining Factors and Impacts of the Intention to Adopt Mobile Banking App in Cameroon: Case of SARA by Afriland First Bank. Journal of Retailing and Consumer Services, 61, Article ID: 102509. https://doi.org/10.1016/j.jretconser.2021.102509

Kang, H. (2015). Sample Size Determination for Repeated Measures Design Using G Power Software. Anesthesia and Pain Medicine, 10, 6-15.
https://doi.org/10.17085/apm.2015.10.1.6

Khan, F., Chowdhury, M. S. A., Haque, A., Akter, S., & Ahsan, S. M. H. (2021).

E-Banking Adoption in Bangladesh; Present Status and Customer Satisfaction: An Evaluation. *Global Journal of Management and Business Research, 21.* https://journalofbusiness.org/index.php/GJMBR/article/view/3327

Khan, G. F., Sarstedt, M., Shiau, W.-L., Hair, J. F., Ringle, C. M., & Fritze, M. P. (2019). Methodological Research on Partial Least Squares Structural Equation Modeling (PLS-SEM): An Analysis Based on Social Network Approaches. *Internet Research*, **29**, 407-429. https://doi.org/10.1108/IntR-12-2017-0509

Khatoon, S., Xu, Z., & Hussain, H. (2020). The Mediating Effect of Customer Satisfaction on the Relationship between Electronic Banking Service Quality and Customer Purchase Intention: Evidence from the Qatar Banking Sector. *SAGE Open, 10.* https://doi.org/10.1177/2158244020935887

Kleijnen, M., de Ruyter, K., & Wetzels, M. (2007). An Assessment of Value Creation in Mobile Service Delivery and the Moderating Role of Time Consciousness. *Journal of Retailing, 83,* 33-46. https://doi.org/10.1016/j.jretai.2006.10.004

Kuikeu, O. (2021). *A Bird Eye from Covid-19 Crisis on the Relevance of the cfa Franc Devaluation of January 1994 and the Honeymoon Effect: An Assessment with the Equilibrium Real Exchange Rate. Cases of Cameroonian and Gabonese Economies*. Munich Personal RePEc Archive, Item ID: 107719. https://mpra.ub.uni-muenchen.de/id/eprint/107719 https://doi.org/10.2139/ssrn.3920603

Lăzăroiu, G., Neguriţă, O., Grecu, I., Grecu, G., & Mitran, P. C. (2020). Consumers' Decision-Making Process on Social Commerce Platforms: Online Trust, Perceived Risk, and Purchase Intentions. *Frontiers in Psychology, 11,* Article 890. https://doi.org/10.3389/fpsyg.2020.00890

Liang, C.-C., & Nguyen, N. L. (2018). Marketing Strategy of Internet-Banking Service Based on Perceptions of Service Quality in Vietnam. *Electronic Commerce Research, 18,* 629-646. https://doi.org/10.1007/s10660-017-9261-z

Lustsik, O. (2004). *Can E-Banking Services be Profitable?* University of Tartu Economics and Business Administration Working Paper (30-2004). https://doi.org/10.2139/ssrn.612762

Makarević, N., Secim, H., & Toycan, M. (2014). IT-Security of E-Banking in Eyes of Croatian Clients. *European Journal of Social and Human Sciences, 2,* 81-89.

Mann, B. J. S., & Sahni, S. K. (2013). Role of Trust and Customer Loyalty in Reducing Perceived Security Risk in Internet Banking. *International Journal of Electronic Business, 10,* 331-354. https://doi.org/10.1504/IJEB.2013.056783

Martins, C., Oliveira, T., & Popovič, A. (2014). Understanding the Internet Banking Adoption: A Unified Theory of Acceptance and Use of Technology and Perceived Risk Application. *International Journal of Information Management, 34,* 1-13. https://doi.org/10.1016/j.ijinfomgt.2013.06.002

Masoud, E., & AbuTaqa, H. (2017). Factors Affecting Customers' Adoption of E-Banking Services in Jordan. *Information Resources Management Journal (IRMJ), 30,* 44-60. https://doi.org/10.4018/IRMJ.2017040103

Mwiya, B., Chikumbi, F., Shikaputo, C., Kabala, E., Kaulung'ombe, B., & Siachinji, B. (2017). Examining Factors Influencing E-Banking Adoption: Evidence from Bank Customers in Zambia. *American Journal of Industrial and Business Management, 7,* 741-759. https://doi.org/10.4236/ajibm.2017.76053

Ndassi Teutio, A. O., Kala Kamdjoug, J. R., & Gueyie, J.-P. (2021). Mobile Money, Bank Deposit and Perceived Financial Inclusion in Cameroon. *Journal of Small Business &*

Entrepreneurship, 1-19. https://doi.org/10.1080/08276331.2021.1953908

NFC (2021). *NFC Bank E-Banking.* https://nfcbank.com/e-banking/

Ngina, F. (2016). *Information and Communication Technology and Service Delivery in Commercial Banks in Kenya.* Unpublished MBA Thesis, University of Nairobi.

Nguyen, H. M., & Khoa, B. T. (2019). A Study on the Chain of Cost Values—Online Trust: Applications in Mobile Commerce in Vietnam. *Journal of Applied Economic Sciences, 1,* 269-280.

Nguyen, T. D., & Huynh, P. A. (2018). The Roles of Perceived Risk and Trust on E-Payment Adoption. In L. H. Anh, L. S. Dong, V. Kreinovich, & N. N. Thach (Eds.). *Econometrics for Financial Applications, ECONVN 2018, International Econometric Conference of Vietnam* (pp. 926-940). Springer. https://doi.org/10.1007/978-3-319-73150-6_68

Nikolina, Ž. H., Renata, M., & Igor, P. (2021). Developing and Validating Measurement Instrument for Various Aspects of Digital Economy: E-Commerce, E-Banking, E-Work and E-Employment. In Information Resources Management Association (Ed.), *Research Anthology on Digital Transformation, Organizational Change, and the Impact of Remote Work* (pp. 540-559). IGI Global. https://doi.org/10.4018/978-1-7998-7297-9.ch028

Nyangosi, R., Arora, J. S., & Singh, S. (2009). The Evolution of E-Banking: A Study of Indian and Kenyan Technology Awareness. *International Journal of Electronic Finance, 3,* 149-165. https://doi.org/10.1504/IJEF.2009.026357

Offei, M. O., & Nuamah-Gyambrah, K. (2016). The Contribution of Electronic Banking to Customer Satisfaction: A Case of GCB Bank Limited-Koforidua. *International Journal of Managing Information Technology, 8,* 1-11. https://doi.org/10.5121/ijmit.2016.8101

Pambudi, A., Widayanti, R., & Edastama, P. (2021). Trust and Acceptance of E-Banking Technology Effect of Mediation on Customer Relationship Management Performance. *ADI Journal on Recent Innovation, 3,* 87-96. https://doi.org/10.34306/ajri.v3i1.538

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing, 64,* 12-40.

Pikkarainen, K., Pikkarainen, T., Karjaluoto, H., & Pahnila, S. (2006). The Measurement of End-User Computing Satisfaction of Online Banking Services: Empirical Evidence from Finland. *International Journal of Bank Marketing, 24,* 158-172. https://doi.org/10.1108/02652320610659012

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer Acceptance of Online Banking: An Extension of the Technology Acceptance Model. *Internet Research, 14,* 224-235. https://doi.org/10.1108/10662240410542652

Prentice, C., Wang, X., & Loureiro, S. M. C. (2019). The Influence of Brand Experience and Service Quality on Customer Engagement. *Journal of Retailing and Consumer Services, 50,* 50-59. https://doi.org/10.1016/j.jretconser.2019.04.020

Promtep, S., Arcand, M., & Cherkaoui, S. (2019). The Impact of Online Service Quality on E-Engagement in the Context of E-Tutoring Services. In *Proceedings of The 10th International Conference on Society and Information Technologies (ICSIT 2019)* (pp. 73-78).

Rashid, K. T. S., Ismael, D. A., Othman, B., & Ali, R. (2019). Dimensions of Service Quality and Their Effects on Achieving Competitive Advantage: An Exploratory Study of Banking Organizations in Sulaimaniyah City—Iraq. *International Journal of Psychoso-*

cial Rehabilitation, 23, 548-565.

Raza, S. A., Jawaid, S. T., & Hassan, A. (2015). Internet Banking and Customer Satisfaction in Pakistan. *Qualitative Research in Financial Markets, 7,* 24-36. https://doi.org/10.1108/QRFM-09-2013-0027

Ringle, C. M., Wende, S., & Becker, J.-M. (2015). *SmartPLS 3.* SmartPLS. https://www.smartpls.com/

Roy, S., & Moorthi, Y. L. R. (2017). Technology Readiness, Perceived Ubiquity and M-Commerce Adoption. *Journal of Research in Interactive Marketing, 11,* 268-295. https://doi.org/10.1108/JRIM-01-2016-0005

Rupa Rege, N. (2003). E-Banking: Challenges and Opportunities. *Economic and Political Weekly, 38,* 5377-5381. http://www.jstor.org/stable/4414436

Salimon, M. G., Yusoff, R. Z. B., & Mohd Mokhtar, S. S. (2017). The Mediating Role of Hedonic Motivation on the Relationship between Adoption of E-Banking and Its Determinants. *International Journal of Bank Marketing, 35,* 558-582. https://doi.org/10.1108/IJBM-05-2016-0060

Sánchez-Torres, J. A., Canada, F.-J. A., Sandoval, A. V., & Alzate, J.-A. S. (2018). E-Banking in Colombia: Factors Favouring Its Acceptance, Online Trust and Government Support. *International Journal of Bank Marketing, 36,* 170-183. https://doi.org/10.1108/IJBM-10-2016-0145

Sandal, A., Manisha, S., & Vikas, C. (2020). E-Banking Frauds: The Current Scenario and Security Techniques. In D. B. A. Mehdi Khosrow-Pour (Ed.), *Encyclopedia of Criminal Activities and the Deep Web* (pp. 905-918). IGI Global. https://doi.org/10.4018/978-1-5225-9715-5.ch061

Shankar, A., Jebarajakirthy, C., & Ashaduzzaman, M. (2020). How Do Electronic Word of Mouth Practices Contribute to Mobile Banking Adoption? *Journal of Retailing and Consumer Services, 52,* Article ID: 101920. https://doi.org/10.1016/j.jretconser.2019.101920

Sharma, H. (2011). Bankers' Perspectives on E-Banking. *Global journal of Research in Management, 1,* 71-85.

Siau, K., & Wang, W. (2018). Building Trust in Artificial Intelligence, Machine Learning, and Robotics. *Cutter Business Technology Journal, 31,* 47-53.

Siddik, M. N. A., Sun, G., Kabiraj, S., Shanmugan, J., & Yanjuan, C. (2016). Impacts of E-Banking on Performance of Banks in a Developing Economy: Empirical Evidence from Bangladesh. *Journal of Business Economics and Management, 17,* 1066-1080. https://doi.org/10.3846/16111699.2015.1068219

Talwar, S., Dhir, A., Khalil, A., Mohan, G., & Islam, A. K. M. N. (2020). Point of Adoption and Beyond. Initial Trust and Mobile-Payment Continuation Intention. *Journal of Retailing and Consumer Services, 55,* Article ID: 102086. https://doi.org/10.1016/j.jretconser.2020.102086

Tamajong, C. F. (2020). *E-Banking Acceptance: An Empirical Study of Cameroonian Customers.* Cardiff Metropolitan University.

Taneja, S., & Ali, L. (2021). Determinants of Customers' Intentions towards Environmentally Sustainable Banking: Testing the Structural Model. *Journal of Retailing and Consumer Services, 59,* Article ID: 102418. https://doi.org/10.1016/j.jretconser.2020.102418

Tangakou, S. R., & Mba, F. A. (2015). Banking Services and Investments in Cameroon: An Approach by the ARDL Method. *Asian Journal of Economic Modelling, 3,* 80-93. https://doi.org/10.18488/journal.8/2015.3.4/8.4.80.93

Tchakounte, U. T. (2021). *Determinants of E-Banking Adoption, Post Adoption and Customer Satisfaction at NFC Bank.* Catholic University of Central Africa.

Thakur, R. (2016). Understanding Customer Engagement and Loyalty: A Case of Mobile Devices for Shopping. *Journal of Retailing and Consumer Services, 32,* 151-163. https://doi.org/10.1016/j.jretconser.2016.06.004

Thakur, R. (2019). The Moderating Role of Customer Engagement Experiences in Customer Satisfaction-Loyalty Relationship. *European Journal of Marketing, 53,* 1278-1310. https://doi.org/10.1108/EJM-11-2017-0895

Themistocleous, M., Basias, N., & Morabito, V. (2015). A Framework for Service-Oriented Architecture Adoption in E-Banking: The Case of Banks from a Transition and a Developed Economy. *Information Technology for Development, 21,* 460-479. https://doi.org/10.1080/02681102.2014.939605

Tojib, D., & Tsarenko, Y. (2012). Post-Adoption Modeling of Advanced Mobile Service Use. *Journal of Business Research, 65,* 922-928. https://doi.org/10.1016/j.jbusres.2011.05.006

Tseng, M.-L., Chang, C.-H., Lin, C.-W., Nguyen, T. T. H., & Lim, M. K. (2020). Environmental Responsibility Drives Board Structure and Financial and Governance Performance: A Cause and Effect Model with Qualitative Information. *Journal of Cleaner Production, 258,* Article ID: 120668. https://doi.org/10.1016/j.jclepro.2020.120668

Vaidya, R. (2016). Trust Formation in Information Systems Implementation in Developing Countries. *Journal of Information, Communication and Ethics in Society, 14,* 182-199. https://doi.org/10.1108/JICES-10-2015-0032

Wei, W., Torres, E., & Hua, N. (2016). Improving Consumer Commitment through the Integration of Self-Service Technologies: A Transcendent Consumer Experience Perspective. *International Journal of Hospitality Management, 59,* 105-115. https://doi.org/10.1016/j.ijhm.2016.09.004

Wondwossen, J., & Dhiraj, S. (2020). The Effect of E-Finance Service Quality on Bank Customers' Fintech E-Loyalty: Evidence from Ethiopia. *International Journal of E-Business Research (IJEBR), 16,* 69-83. https://doi.org/10.4018/IJEBR.2020040105

Wu, M., Jayawardhena, C., & Hamilton, R. (2014). A Comprehensive Examination of Internet Banking User Behaviour: Evidence from Customers Yet to Adopt, Currently Using and Stopped Using. *Journal of Marketing Management, 30,* 1006-1038. https://doi.org/10.1080/0267257X.2014.935459

Yang, H., Yu, J., Zo, H., & Choi, M. (2016). User Acceptance of Wearable Devices: An Extended Perspective of Perceived Value. *Telematics and Informatics, 33,* 256-269. https://doi.org/10.1016/j.tele.2015.08.007

Yang, S., Li, Z., Ma, Y., & Chen, X. (2018). Does Electronic Banking Really Improve Bank Performance? Evidence in China. *International Journal of Economics and Finance, 10,* 82-94. https://doi.org/10.5539/ijef.v10n2p82

Yasin, M., Liébana-Cabanillas, F., Porcu, L., & Kayed, R. N. (2020). The Role of Customer Online Brand Experience in Customers' Intention to Forward Online Company-Generated Content: The Case of the Islamic Online Banking Sector in Palestine. *Journal of Retailing and Consumer Services, 52,* Article ID: 101902. https://doi.org/10.1016/j.jretconser.2019.101902

Yu, P. L., Balaji, M. S., & Khong, K. W. (2015). Building Trust in Internet Banking: A Trustworthiness Perspective. *Industrial Management & Data Systems, 115,* 235-252. https://doi.org/10.1108/IMDS-09-2014-0262

Yu, Y., & Ramaprasad, J. (2019). *Engagement on Digital Platforms: A Theoretical Pers-*

pective. In *ICIS 2019 Proceedings.*
https://aisel.aisnet.org/icis2019/business_models/business_models/9

Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to Explain Mobile Banking User Adoption. *Computers in Human Behavior, 26,* 760-767.
https://doi.org/10.1016/j.chb.2010.01.013

Zimmermann, V., & Gerber, N. (2020). The Password Is Dead, Long Live the Password—A Laboratory Study on User Perceptions of Authentication Schemes. *International Journal of Human-Computer Studies, 133,* 26-44.
https://doi.org/10.1016/j.ijhcs.2019.08.006

Appendix A

Constructs	Items	Adapted from
Use of e-banking	US1: I often use e-banking to manage my account. US2: I often use e-banking to transfer and remit money. US3: I often use e-banking to make payments.	(Zhou et al., 2010)
Usage continuance	UC1: I intend to continue using this e-banking. UC2: I will keep using this e-banking as regularly as I do now. UC3: My intention is to continue using this e-banking than using any alternative means. UC4: I intend to continue using e-banking rather than discontinue	(Adapa & Roy, 2017; Gupta et al., 2020)
Customer satisfaction	CS1: My overall experience of the e-banking is satisfying. CS2: My overall experience of the e-banking is pleasant. CS3: My overall experience of the e-banking is delightful. CS4: I am satisfied with e-banking effectiveness	(Tojib & Tsarenko, 2012; Cho & Lee, 2020; Gupta et al., 2020)
Trust	TR1: I trust my bank to offer secure e-banking TR2: I find e-banking secure in conducting transactions. TR3: I find e-banking safe for receiving bank statements. TR4: I trust my bank to maintain the privacy of my transactions	(Boateng et al., 2016; Adapa & Roy, 2017)
Perceived personal information protection	PI1: I believe my information is kept confidential PI2: I believe my privacy will not be divulged PI3: I feel secured to supply my data over the e-banking app (website) PI4: I believe that the bank will not expose my personal information to any third party.	(Devi Juwaheer et al., 2012; Martins et al., 2014; Gupta et al., 2020)
Perceived transaction security	TS1: I believe my transactions are secured TS2: I do not hesitate to use e-banking for fear of making mistakes I cannot correct TS3: E-banking can be efficient and create fewer problems TS4: I am not worried to use e-banking as I know my transactions will be secured and safe. TS5: I do not entertain fear that the platform of e-banking will wrongly process my transactions.	(Mann & Sahni, 2013; Deb & Lomo-David, 2014; Salimon et al., 2017)
Perceived time saving	PT1: Using e-banking is an effective way to manage my time PT2: Using e-banking would be convenient for me PT3: Using e-banking would allow me to save time PT4: Using e-banking would make transactions less time consuming	(Kleijnen et al., 2007)
Service quality	SQ1: The e-banking app is easy to navigate. SQ2: The e-banking app is well structured. SQ3: The e-banking app is easy to use. SQ4: The e-banking app is beautifully designed. SQ5: The e-banking technicians promptly respond to problems encountered with the e-banking	(Parasuraman et al., 1988)
Perceived cost saving	PC1: I am happy with the price charges for performing e-banking PC2: Performing e-banking transactions is the right decision when price and other expenses are considered PC3: E-banking transactions are economical PC4: Using e-banking is cheap	(Adapa & Roy, 2017)