



Print ISSN: 1738-3110 / Online ISSN 2093-7717  
 JDS website: <http://www.jds.or.kr/>  
<http://dx.doi.org/10.15722/jds.20.08.202208.69>

# Customer's Satisfaction About Mobile Banking Distribution Channel in Vietnamese Commercial Banks

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Received: April 19, 2022. Revised: June 29, 2022. Accepted: August 05, 2022.

## Abstract

**Purpose:** In the context of the emergence of industry 4.0, using mobile phones as a modern distribution channel to execute financial services is a significant solution for commercial banks' retail services and a gateway to promote financial inclusion and market development. Despite that service quality and customer satisfaction are two diverse notions and closely related to each other in the service sector, there is hardly a research which empirically examines the impacts of each dimensions of mobile banking service quality and customer satisfaction. **Research design, data and methodology:** This study first employs in-depth interview to explore various aspects of mobile banking service quality dimensions, including empathy, responsiveness, tangibility, assurance, and reliability that serves to develop measurement scales and hypothesis development. A quantitative survey is followed to collect data from 265 Vietnamese bank customers to empirically test the conceptual model. **Results:** Our findings indicate that more human-related factors including empathy, assurance, and responsiveness show the strongest impacts on customer satisfaction with mobile banking service while tangibility and reliability, as technical aspects, are less influential factors. **Conclusions:** Finally, some crucial implications are drawn for the banks to manage consumer behavior in mobile banking.

**Keywords:** Mobile Banking, Vietnam, Commercial Banks, Determinants, Distribution Channels, Banking Distribution Channels, Multichannel Distribution.

**JEL Classification Code:** G21, G00, O31

## 1. Introduction

The application of digital technology in the financial industry in the 21st century has been transforming the ways banking services are provided to customers (Feyen, Frost, Gambacorta, Natarajan, & Saal, 2021). Inevitably, the commercial banks' ability to provide modern technology-based solutions to customers becomes a crucial dimension of competitive advantages. Besides advanced banking facilities such as online banking and ATM service, mobile banking emerges as one of the most convenient banking services due to the widespread of mobile technology (Komulainen & Saraniemi, 2019). The benefits of mobile

banking are not limited to the growth of revenue for commercial banks or telecommunication companies. Beyond a banking service, mobile banking increases access to fundamental financial services for millions of vulnerable people. Specifically, the adoption of mobile phones and the emergence of mobile financial services, also known as the convergence of mobile and financial services, is widely recognized to promote financial inclusion among the unbanked segment, especially in developing countries (Kanobe, Alexander, & Bwalya, 2017). While the ownership of mobile phones has increased at an accelerating rate, taking advantage of mobile inclusion for the adoption of mobile banking is a crucial strategy to boost financial

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inclusion (Kim, Zoo, Lee, & Kang, 2018). To put it simply, mobile banking means that banking transactions are not conducted face to face but via a mobile device such as a cell phone. Through the integration between mobile communication and electronic money, mobile banking facilitates the implementation of various banking activities on the mobile phone platform. Despite that the increasing popularity of mobile phones providing a great opportunity for commercial banks to spread the adoption of mobile banking, it also brings challenges to satisfying and retaining mobile banking customers. The understanding of factors that affect customer satisfaction in mobile banking, hence, is crucial for commercial banks to formulate effective strategies that enhance customer satisfaction and build their competitive advantages while contributing to the promotion of financial inclusion. There is a strand of research that examines the determinants of customer satisfaction with mobile banking services in different nations such as the United States (Luo, Lee, Mattila, & Liu, 2012); Nigeria (Bankole, Bankole & Brown, 2017); Bangladesh (Jahan & Shahria, 2021) and United Kingdom (Gebren & Jabbar, 2021).

In Vietnam, the adoption of mobile banking has increased at an accelerating rate due to the growing ownership of smartphones and the widespread of the Internet in various segments of society. The Covid-19 pandemic further encourages more bank customers to use mobile banking services for their convenience. On the one hand, the introduction of Mobile Banking is a significant success that has eliminated the hurdles and constraints of space and time in the provision of banking services which can be considered as one of the most important distribution channel of the banks. On the other hand, Vietnamese commercial banks are struggling to catch up with new trends in mobile banking and satisfy their customers because they understand that “increasing advancements in the technology industry are forcing people to become more accustomed to digital financial transaction activities” (Chohan, Aras, Indra, Wicaksono, & Winardi, 2022).

Despite the importance of mobile banking in the banking industry, there is a little study in the Vietnamese context that both explores and statistically investigates the determinants of customer satisfaction with mobile banking. Customer satisfaction is an affective response resulting from the evaluation and comparison between the actual service experience and pre-purchase expectations. We, therefore, argue that the determinants of customer satisfaction with mobile banking may vary across country contexts given the differences in the levels of financial knowledge and mobile inclusion. This research’s results are, hence, relatively significant because of the particular nature of the Vietnam banking context. On the one hand, the levels of overall financial inclusion and financial knowledge in this country

remain low. On the other hand, a person can use financial services offered by both various commercial banks and informal alternatives to banks at the same time. Those factors may shape customers’ expectations and perceptions of mobile banking service experience in distinct ways. This may either change the nature and importance of mobile banking’s dimensions that have been found or added some new determinants that influence customer satisfaction with mobile banking services.

This research was conducted in two phases. Firstly, interviews with bank customers were conducted to explore the dimensions of mobile banking service quality that serve to develop a conceptual model and measurement scales for each construct in the model. After that, a survey method was adopted to collect quantitative data from 265 bank customers for the evaluation of measurement scales and hypothesis testing. Findings from this research are then analysed and discussed to provide helpful implications for bank management and policymakers in improving mobile banking service quality towards the enhancement of customer satisfaction.

## **2. Literature Review**

### **2.1. Mobile Banking**

Mobile banking is a new distribution channel that allows clients to use mobile devices connected to wireless telecommunications networks to access financial services remotely (Omarini, 2017). It is defined as a powerful new distribution channel and customer relationship management tool for financial services companies because there are more phones than PCs in the market and mobile phones make it simple to communicate with the target market (Omarini, 2017). Clients can see their account balances and transaction history, as well as transfer funds, pay bills, trade stocks, and manage their financial portfolios. Mobile banking has been defined as the use of a mobile device to communicate with a financial institution - a bank that assists customers with service requests - over a telecommunications network (Ozili, 2018).

According to Barnes and Corbitt (2003), mobile banking can be regarded as “the outcome of recent advancements and breakthroughs in the telecommunications sector, giving a new entry point for users”. Mobile banking is a sort of e-commerce in which a bank communicates with consumers via a mobile device and allows them to access all of the bank’s facilities and services via a mobile application. Although there are many various definitions of mobile banking, they all share the same essential components. First, it is a partnership between financial institutions and mobile

carriers that enables consumers to engage with one another remotely via telecommunications networks such as mobile phones or tablets that have applications loaded. Customers can vary transaction ways with various conveniences and simple operations thanks to the internet connection, which saves time and money. Second, mobile banking is, in fact, a new branch of e-banking or can be described as a means of providing modern and advanced e-banking services in parallel with technological means (Alsamydai, 2014). In other words, mobile banking is one of the means of providing modern and advanced electronic banking services. Third, as integration between mobile communication and electric money, mobile banking could facilitate various banking transactions such as obtaining account details, including the account balance; looking up the history of banking transactions, bank transfers or making payments for products and services. Fourth, Mobile phones - can be used as an access device for several distribution channels (telephone, Internet, mobile). Its form and functionality begins to overlap with the PC. An important difference is that the mobile phone includes a personalized SIM card that gives additional possibilities, for example it can be used for user authentication (Murowaniecki, 2015)

Nowadays, mobile banking could be integrated with a wide range of phones, including those with iOS, Android, and BlackBerry operating systems with the support of other digital technologies, including Java, and GPRS (General Packet Radio Service), 3G, or wifi Internet access.

Generally, mobile banking is a business model coded in the form of software, sometimes known as an application supplied by a bank or other financial institution that allows consumers to execute financial transactions and control their accounts at any time and from any location. In this sense, mobile banking is offering added value to customer relationship management (CRM) and really one of the most valuable multichannel distribution of banks (Omarini, 2017).

## 2.2. The Concept of Customer Satisfaction

Customer satisfaction is a widely used indicator of product/service quality and marketing effectiveness in almost customer-centric organizations.

About the service quality, Ramya, Kowsalya, and Dharanipriya (2019) show that service quality is an assessment of how well a delivered service conforms to the client's expectations. Service quality and customer satisfaction are important aspects of business since a company's growth is largely dependent on how well it maintains its customers through service and how well they keep their customers satisfied (Edward & Sahadev, 2011). According to Chang, Jang, Li, and Kim (2017), customer satisfaction is expected to result from good service efficiency, which will improve customer engagement and

interrelationship. Service quality also can be regarded as customers emotional state and direct response generated from their appraisal of product/service usage based on the contrasting between perceived actual product/service performance and promised/expected one (Bui & Nguyen, 2021).

The gap between such two levels is named the "zone of tolerance" within which service performance can lead to customer satisfaction. Thus, if service performance goes over the desired level, customers' demand for service quality will be surpassed and their loyalty toward the service providers will be enhanced. Existing scholars suggest two principal methods to assess the level of customer satisfaction those are transaction-specific and cumulative measures (Andreassen, 2000). The former approach is employed to assess customer satisfaction with a certain service transaction (Andreassen, 2000). On the other hand, the latter approach is employed to measure overall customer satisfaction with brand impression and general service experience accumulated over time. In addition, according to (Gupta & Zeithaml, 2006), overall satisfaction has been employed in a large number of researches in the field of service marketing. The two famous American Customer Satisfaction Index and The Swiss Index of Customer Satisfaction frameworks, which are widely used to measure customer satisfaction, also follow the accumulative satisfaction approach (Bruhn & Grund, 2000). Accordingly, the author of this paper has chosen to measure overall customer satisfaction. Pakurár, Haddad, Nagy, Popp, and Oláh (2019) also aim to examine service quality dimensions which can be used to measure customer satisfaction, therefore, it can be understood that these two concepts have strong relationship with each other. In the banking context, Moiz, Nguyen, Aquino, Jalagata, and Nguyen (2020) dedicate that customer in the context of banking is very essential as the focal point between banks and the clients so they find that service quality in banks has the most influence on customer satisfaction.

## 2.3. The Relationship Between Service Quality and Customer Satisfaction of Mobile Banking Service

Rooted from the concept of customer satisfaction, service quality which demonstrates the actual service experience, and hence, reflects the "received" level is closely linked to customer satisfaction. A positive relationship between service quality and customer satisfaction in the banking industry has been affirmed in many studies (Kant & Jaiswal, 2017; Pakurár, Haddad, Nagy, Popp, & Oláh, 2019). The existing literature reveals that factors that determine the extent to which users of mobile banking services feel satisfied are mostly attributed to various dimensions of service quality. Those factors are

linked directly to general banking service (such as customer support, responsiveness, and adaptation) or technical aspects of mobile banking app (e.g., usability, possibility to personalize, security, utility expectancy, and effort expectancy) (Bankole et al., 2017; Jahan & Shahria, 2021). From a problematization approach, Geebren and Jabbar (2021), Lee and Kim (2021) investigate factors that influence customer trust and satisfaction in mobile banking among British customers. The study affirms that system quality, information quality, and services quality have positive impacts on customer trust that in turn, enhance customer satisfaction with mobile banking. Nevertheless, there is hardly any research that comprehensively explores the association between comprehensive dimensions of mobile banking service quality and customer satisfaction, especially in a developing country with low financial knowledge in Vietnam.

Dimensions of mobile banking service quality have been explored and validated in a study by Pagani (2004). Specifically, in the 3rd generation model of customer adoption of mobile banking services, Pagani (2004) mentions 5 dimensions of mobile banking service quality that may affect customer satisfaction, including empathy, responsiveness, reliability, assurance, tangibility, and reliability with detailed measurement scales for each construct. In this research, we develop the conceptual model linking service quality and customer satisfaction of mobile banking service quality based on the five dimensions as proposed by Pagani (2004). However, given the special context of Vietnam, we attempt to further conduct qualitative research with an in-depth interview with mobile banking customers to formulate more reliable and relevant measurement items for the five constructs. The next section presents the sub-hypotheses which are supported by findings from the interview phase.

### **2.3.1. Empathy and Customer Satisfaction**

Customers expect that their distinct needs and wants are understood and given priority by their service providers. The ability of the organization in providing services that are personalized to customers while showing personal care and attention in every transaction is regarded as “empathy”. Empathy represents a competitive advantage of commercial banks in understanding and adapting customers’ requirements better, hence, strongly influences the level of customer satisfaction (Ananth, Ramesh, & Prabaharan, 2011; Paul, Mittal, & Srivastav, 2016; Shanka, 2012; Navaratnaseel & Periyathampy, 2014). Given the core concept of empathy, which is making customers feel that they are unique and special (Parasuraman, Zeithaml, & Berry, 1988), in the in-depth interview, we ask participants “Do you feel that you are treated uniquely and especially when you use mobile banking services? And why?”. Some

prominent dimensions of empathy associated with mobile banking services have emerged. Especially, empathy is demonstrated not only in the way the bank’s staff interact with customers, such as showing concern for each customer in terms of consumer preferences, health, and work and hence, understanding the special needs of customers to personalize mobile banking service or grasping the services that customers use regularly to consult immediately when needed but also frequently improving the Mobile Banking App according to customers’ wishes and offering interesting programs for customers such as promotions and games. In turn, perfectly meeting customers’ expectation in terms of either psychological needs or financial needs by showing “empathy” contribute to overall customer satisfaction.

**H1:** Empathy positively affects customer satisfaction with mobile banking services

### **2.3.2. Assurance and Customer Satisfaction**

Given the complex nature of banking services which may entail risk and uncertainty, assurance is a crucial aspect of banking service quality (Parasuraman et al., 1988). This dimension is built upon the banking staff’s courtesy and knowledge that make them capable to enhance customer trust and confidence (Kant & Jaiswal, 2017). In more detail, assurance is embedded in the attitudes and behaviour of the staff and their provision of friendly, confidential, courteous, and competent services (Parasuraman et al., 1988). In the banking sector, assurance is reflected in customer assistance, accuracy in completing orders, records and quotations, and the employment of an experienced professional team (Sadek, Zainal, Taher, Yahya, Shaharudin, Noordin, Zakaria, & Jusoff, 2010). Those factors show strong impacts on the satisfaction of bank customers (Sadek et al., 2010). To explore the specific aspects of assurance in the context of mobile banking service, participants are asked “Do you feel confident when using mobile banking service? If yes, how do the staff and the mobile banking app support your confidence?”. Based on the respondents’ answers, it is found that assurance is rooted in not only the ability of the bank’s staff in guiding and advising the use of mobile banking but also the quality of the mobile banking app itself in serving customers quickly and accurately whenever they need it.

**H2:** Assurance positively affects customer satisfaction

### **2.3.3. Tangibility and Customer Satisfaction**

Given the intangible nature of services, tangibility, as embedded in the physical facilities of the service provider, would form the customer expectation about the service and affect the actual service experience (Parasuraman et al., 1988). The linkage between tangibility and customer satisfaction in the banking sector is affirmed in many studies

(Krishnamurthy & SivaKumar, 2020; Paul et al., 2016; Munusamy, Chelliah, & Mun, 2010; Shanka, 2012; Lau, Cheung, Lam, & Chu, 2013). The tangibility properties of mobile banking services are explored in the qualitative phase through the participants’ answers to the question “Please describe your currently used mobile banking app in terms of what you can see and touch”. Some tangible aspects of mobile banking services are mentioned, including the interface, the design, and the applicable terms of mobile apps in terms of their appearance, convenience, and ease to use correspondingly. Those tangibilities constitute the overall customer experience of using mobile banking services and hence, are directly linked to customer satisfaction.

**H3:** Tangibility positively affects customer satisfaction with mobile banking services

**2.3.4. Responsiveness and Customer Satisfaction**

Due to the high level of intangibility of service, customers also expect to know exactly what is going on, and when and how things will be done to reduce their uncertainty (Parasuraman et al., 1988). The responsiveness that indicates the ability of the service providers in giving customers undivided attention and immediate response to customer requests is, therefore, contributes positively to overall customer satisfaction. Banking sector responsiveness is mostly concerned with how banks respond to customers via their front-line staff and have a direct relationship with customer satisfaction (Kant & Jaiswal, 2017; Lee & Moghavvemi, 2015; Paul et al., 2016; Lau et al., 2013). Different from traditional banking services, users of mobile banking services mostly receive information through the app and only interact with the bank staff when necessary. During the in-depth interview, the responsiveness of mobile banking service is explored through the question “What types of information do you expect to receive during your usage of mobile banking service? How could you receive such information?”. Account information, transaction results, and technical support are key information that they can get either through the app or their banks’ staff. Correspondingly, the ability of the mobile

banking app and the technical support service in providing such information quickly and adequately may influence the overall customer satisfaction.

**H4:** Responsiveness positively affects customer satisfaction

**2.3.5. Reliability and Customer Satisfaction**

Similar to traditional banking services, customers of mobile banking may also expect to obtain the functional value of this service the most (Parasuraman et al., 1988; Ennew, 2013). Mobile phones - can be used as an access device for several distribution channels (telephone, Internet, mobile). Its form and functionality begins to overlap with the PC. An important difference is that the mobile phone includes a personalized SIM card that gives additional possibilities, for ex- ample it can be used for user authentication (Murowaniecki, 2015)

Reliability means the service providers deliver services promptly and reliably consistently and treat customer problems properly (Ennew.C., 2013). This also indicates that the organization fulfils its promises to customers and meet their expectation through the service results. The basic aspects of reliability in the banking sector encompass the accuracy in completing orders, billing, and the fulfilment of promised services (Lee & Moghavvemi, 2015). These dimensions demonstrate significant effects on customer satisfaction with banking services in many empirical studies (Kant & Jaiswal, 2017; Lee & Moghavvemi, 2015; Paul et al., 2016; Lau et al., 2013). The reliability aspects of mobile banking services are identified through the in-depth interview where participants share their expectations about what they could receive by using mobile banking. Specifically, timely and complete information (such as fees, usage, promotions about Mobile banking), quick and satisfactory solutions for any inquiries and complaints, confidentiality, security, and core functional value (as traditional banking services) are among the prominent wishes of customers. Meeting that customer expectation indicates the provision of reliable services that contributes to overall customer satisfaction.

**H5:** Reliability positively affects customer satisfaction

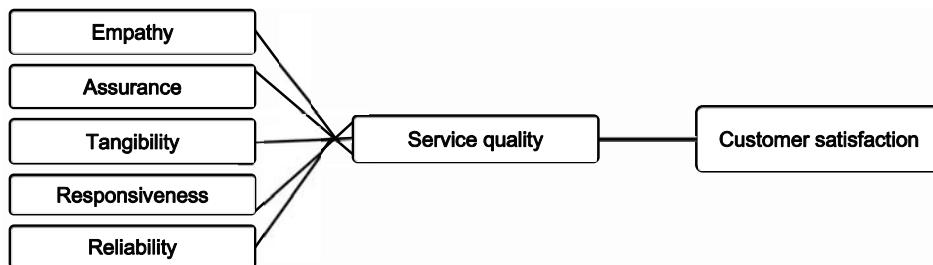


Figure 1: Proposed conceptual framework

### 3. Research Methodology

Given the distinct nature of mobile banking itself and the specific development phase of mobile banking in Vietnam, this research first employs in-depth interviews with 52 bank customers to explore the dimensions of mobile banking service quality as a modern distribution channel and their potential linkage to customer satisfaction. In the next phase, this research employs a quantitative survey to collect primary data for measurement evaluation and hypothesis testing. A paper-based questionnaire was designed for the data collection process. Measurement scales are drawn from previous studies (Hair, Gabriel, Silva, & Junior, 2019) and adapted to the context of the Vietnamese Mobile Banking service to ensure face validity (See Table 1), with 5 items for each dimension. A five-point Likert scale was employed to score each latent variable with 1= Strongly disagree; 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5= Strongly agree because with a Five - point scale, it is quite simple for the interviewer to read out the complete list of scale descriptors and has been most recommended by the researchers that it would reduce the frustration level of patient respondents and increase response rate and response quality (Taherdoost, 2019).

The questionnaire was translated into Vietnamese and pretested with 20 Vietnamese bank customers from all walks of life to ensure the questionnaire's comprehension; easy-to-understand language and phraseology; ease of answering;

practicality and length of the survey. The survey was implemented from January to November of 2021 in 16 banks of Vietnam. Drawn from the initial sample size of 300 units, 265 responses are valid for further analysis. This final sample size is deemed to be adequate for exploratory factor analysis and regression analysis (Comrey, 1973; Hair et al., 2019; Roger, 2006). The collected data was first employed to test the reliability and validity of the measurement scales before being subject to hypothesis testing.

Table 2 presents the final sample structure. Regarding gender, female bank customers account for the majority of the sample. This proportion is reasonable due to Vietnamese culture where women are usually responsible for their households' daily payment transactions. Table 2 also indicates that the sample's age structure is relatively similar to that of the population. In addition, the sample is dominated by the age group of 20 to 40, with 88.3%. Concerning income, most sampling units have a monthly income of less than 10 million VND. The age and income structure of the sample suit the demographic of overall Vietnamese bank customers according to World Bank statistics. The sample is dominated by those who attain tertiary education level and above with 70.6%. This could be explained by the selection of Hanoi city where most higher education institutions in the North of Vietnam are located as the venue for data collection. The sample also covers customer segments of various commercial banks in Vietnam, either state-owned or private ones as well as different levels of transaction frequency.

**Table 1:** Measurement scales

No.	Constructs	Item code	Measurement items
1.	Empathy	EMP1	Employees always show concern for each customer in terms of consumer preferences, health, and work to personalize Mobile Banking service
2.		EMP2	The bank always improves the Mobile Banking App according to customers' wishes.
3.		EMP3	The bank understands the special needs of its customers and cares about the other needs of its customers.
4.		EMP4	Employees always grasp the services that customers use regularly to consult immediately when needed.
5.		EMP5	In Mobile Banking the bank has interesting programs for customers such as promotions and games.
6.	Assurance	ASU1	The Mobile Banking app serves customers quickly and accurately as soon as customers need to use it.
7.		ASU2	The registration procedure for using the Mobile Banking service is simple and fast.
8.		ASU3	Staff are always dedicated to guiding customers to register and use the Mobile Banking service.
9.		ASU4	The bank's staff answer questions about Mobile Banking quickly and easily.
10.		ASU5	Staff are friendly and welcoming when answering about Mobile Banking.
11.	Tangibility	TAN1	The interface of the Mobile Banking app is very beautiful and modern.
12.		TAN2	The application items in Mobile banking bring many conveniences to customers.
13.		TAN3	The Mobile Banking app is easy to use.
14.		TAN4	The Mobile Banking app is easy to set up.
15.		TAN5	The documents on the Mobile Banking service are designed and easy to understand.
16.	Responsiveness	RES1	It is easy to look up the account information when accessing Mobile Banking.
17.		RES2	The online technical support service of Mobile Banking is always ready to solve any problems of customers.
18.		RES3	The functions of Mobile Banking fully meet the needs of customers.
19.		RES4	Mobile Banking notifies transaction results quickly and accurately.
20.		RES5	The transaction processing speed of the Mobile Banking is fast.

21.	Reliability	REL1	The bank provides timely and complete information (such as fees, usage, and promotions about Mobile banking) to customers.
22.		REL2	Inquiries and complaints about Mobile Banking are quickly and satisfactorily resolved by the bank.
23.		REL3	Username, password, balance, and other information are kept confidential.
24.		REL4	Performing transactions on the Mobile Banking application brings the experience and feeling like a direct transaction at the counter.
25.		REL5	Using the bank's Mobile Banking is risk-free
26.	Satisfaction	SAT1	I feel completely satisfied with the quality of the Mobile Banking service of the bank.
27.		SAT2	I will continue to use the bank's Mobile Banking service.
28.		SAT3	I am ready to recommend Mobile Banking services to others.

**Table 2:** Sampling structure

Features		Number	Percentage
Gender	Male	87	32.8
	Female	178	67.2
Age	Less than 20	16	6.0
	From 20 to less than 40	234	88.3
	Above 40	15	5.7
Income	Less than 5 million VND per month	149	56.2
	From 5 million to less than 10 million VND per month	55	20.8
	From 10 million to 20 million VND per month	43	16.2
	Above 20 million VND per month	18	6.8
Education	Secondary	27	10.2
	Intermediate	3	1.1
	Colleges	13	4.9
	University	187	70.6
	Postgraduate	35	13.2
Bank	Vietinbank	28	10.6
	Vietcombank	28	10.6
	BIDV	32	12.1
	Agribank	31	11.7
	ACB	3	1.1
	VIB	2	0.8
	Techcombank	57	21.5
	TPBank	19	7.2
	LienVietPostBank	1	0.4
	MB	29	10.9
	MSB	1	0.4
	HDBank	6	2.3
	Sacombank	4	1.5
	SeABank	2	0.8
	SCB	2	0.8
VPBank	20	7.5	
Transaction frequency	Less than 7 times a week	176	66.4
	From 7 times to less than 14 times a week	70	26.4
	From 14 times to 21 times a week	10	3.8
	More than 21 times a week	9	3.4

## 4. Results and Discussion

### 4.1. Evaluating Measurement Properties

To test the reliability or the internal consistency of the

measurement items for each construct, Cronbach's alpha was calculated in SPSS. Accordingly, ASU2 and TAN3 were deleted to ensure acceptable reliability. Table 3 shows the Cronbach's alpha coefficients for all six constructs after ASU2 and TAN3 were removed. These reliability indicators were acceptable (i.e. all Cronbach's Alpha values are higher

than 0.7). Therefore, the reliability of these constructs was satisfactory (Tavakol & Dennick, 2011).

To test the validity of the measurement scales, the remaining 26 measurement items which measure 6 independent variables including were subject to EFA on SPSS with principal factor as extraction method followed by a varimax rotation. We first conduct EFA for 5 independent variables including EMP, ASU, TAN, RES, and REL before running EFA for overall perceived quality, as the dependent variable.

The EFA results for independent variables show five determinants emerged subjected to how these constructs were initially measured. Results, as shown in Table 4, reveal that the KMO indicator is greater than the threshold of 0,5 as suggested by Garson (2003) while Barlett's test result has a p-value smaller than 0.05. Accordingly, conditions for EFA are satisfied. Furthermore, EFA results as presented in Table 5 indicate that all factor loadings are greater than the cut-off value of 0.5. Based on guidance proposed by Anderson and Gerbing (1988), (p\_value) sig = 0.000 < 0.05 shows that the validity of the measurement for the six constructs was confirmed.

Next, we conduct EFA to evaluate the validity of the measurement scale for overall perceived service quality. The EFA results show only one factor subjected to how SAT was initially measured. Results, as shown in Table 6, reveal that the KMO indicator is greater than the threshold of 0.5 as suggested by Garson (2003) while Barlett's test result has a p-value smaller than 0.05. Accordingly, conditions for EFA are satisfied. Furthermore, EFA results as presented in Table 7 indicate that all factor loadings are greater than the cut-off value of 0.5. Based on guidance proposed by Anderson and Gerbing (1988), a p-value less than 0.05 shows that the validity of the measurement for SAT was confirmed.

According to the above results, we decided to retain the construct with its measurement items as shown in Table 5 and Table 7 to conduct the hypothesis testing.

**Table 3:** Cronbach's Alpha coefficients

Variables	No. measurement items	Cronbach's Alpha
EMP	5	0.888
ASU	4	0.872
TAN	4	0.813
RES	5	0.896
REL	5	0.871
QUAL	3	0.828

**Table 4:** KMO and Barlett's test (for independent variables)

KMO and Barlett's test	
KMO	0.842
Barlett's test	3449.605
df	253
Sig.	0.000

**Table 5:** EFA results (for independent variables)

Measurement items	Components and factor loadings				
	1	2	3	4	5
RES1	0.863				
RES5	0.847				
RES2	0.781				
RES3	0.775				
RES4	0.722				
EMP5		0.859			
EMP1		0.833			
EMP2		0.821			
EMP3		0.757			
EMP4		0.757			
REL5			0.861		
REL4			0.783		
REL3			0.781		
REL2			0.779		
REL1			0.759		
ASU3				0.881	
ASU4				0.827	
ASU1				0.819	
ASU5				0.766	
TAN1					0.838
TAN2					0.826
TAN4					0.799
TAN5					0.687

**Table 6:** KMO and Barlett's test (for dependent variables)

KMO and Barlett's test	
KMO	0.713
Barlett's test	300.530
df	3
Sig.	0.000

**Table 7:** EFA results (for dependent variable)

Measurement items	Factor loadings
	1
SAT2	0.889
SAT3	0.853
SAT1	0.848

## 4.2. Hypothesis Testing

The following regression model was tested using SPSS:

$$SAT_i = \beta_0 + \beta_1 EMP_i + \beta_2 ASU_i + \beta_3 TAN_i + \beta_4 RES_i + \beta_5 REL_i + \varepsilon$$

Regression results shown in Table 8 show that the variance inflation factor (VIF) indicator for each dependent



variable which assesses how much the variance of an estimated regression coefficient increases if predictors are correlated is smaller than the recommended cut-off value of 5. Therefore, multi-collinearity among independent variables is minor and does not significantly affect the regression results.

In addition, regression results in Table 8 also reveal that

all of the five dimensions of mobile banking service quality have statistically significant positive impacts on overall customer satisfaction with a confidence interval of 95%. Moreover, the model of these given factors collectively explains for 58.9% variance of banks' information infrastructure (i.e. Adjusted R<sup>2</sup>= 0.589).

**Table 8:** Regression analysis results

Variables	Unstandardized coefficients		Standardized coefficients	t-value	Sig. (p_value)	VIF	Hypothesis testing
	B	Std. Error	$\beta$				
(Constant)	-0.592	0.22		-2.69	0.008		
EMP	0.224	0.034	0.29	6.629	<0.001*	1.228	Accept H1
ASU	0.19	0.031	0.265	6.065	<0.001*	1.225	Accept H2
TAN	0.245	0.047	0.216	5.178	<0.001*	1.117	Accept H3
RES	0.266	0.049	0.253	5.409	<0.001*	1.401	Accept H4
REL	0.208	0.047	0.192	4.454	<0.001*	1.197	Accept H5

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.772a	.597	.589	.47942

## 5. Discussion and Implication

Based on the core concept of customer satisfaction, this study identifies the factors that shape the overall mobile banking distribution channel and hence influence customer satisfaction with mobile banking service in commercial banks of Vietnam. The result reveals that all five dimensions of mobile banking distribution channel quality including empathy, assurance, tangibility, responsiveness, and reliability strongly affect Vietnamese customer satisfaction with mobile banking services. These findings are in line with previous studies on the impact of service quality on customer satisfaction with mobile banking distribution channel (Bankole et al., 2017; Geebren & Jabbar, 2021; Jahan & Shahria, 2021; Bala, Jahan, Amin, Tanin, Islam, Rahman & Khatun, 2021). Among those factors, empathy emerges as the most influential factor, followed by assurance, and responsiveness. Meanwhile, tangibility and reliability show fewer impacts. Interestingly, the three dimensions of service quality that have the strongest influence on customer satisfaction with mobile banking distribution services which entails a high level of service intangibility are related to how customers are treated when they interact with the front-line staff. This could be explained by the nature of banking services which entails complexities and risks. Although mobile banking distribution channel can give the bank customers more autonomy in controlling their banking transactions without the direct support and response from the staff, customers still expect to receive personalized services, consultancy,

dedicated care, and highly attentive support from the banks' staff. Those factors would alleviate the sense of risk while enhancing trust among users of mobile banking services. On the other hand, as a modern technology-based banking distribution channel, the technical dimensions of mobile banking that are embedded in either the responsiveness (quick and accurate transaction processing), the tangibility (the interface, ease and convenience of the mobile banking app), and the reliability (security, authenticity and confidentiality) also form the expectation and overall experience of bank customers. The specific context of Vietnam's banking industry may also be a crucial reason for the prevalence of those "human-related" factors over technical aspects in shaping customer satisfaction with mobile banking. Specifically, the development of mobile banking in Vietnam is only in its early phase while the financial knowledge of Vietnamese bank customers remains relatively low. The uncertainty of using such a new banking service may become the most concern to customers rather than the technical factors that could be standardized.

From the strategic perspective, this research findings provide crucial implications for practitioners in the banking industry to enhance customer satisfaction with mobile banking services and hence, encourage them to either continue their use of this platform or recommend it to others. As a combination of banking services and technical apps, satisfying customers of mobile banking distribution channel may be more complicated than those of traditional banking services. Our findings suggest that in the early phase of mobile banking adoption like in Vietnam, besides technical

issues, the commercial banks should give more concerned about the human-related dimensions of mobile banking service quality to negate uncertainty and build trust among customers. Specifically, offering mobile banking services which entails a high level of intangibility still needs the backup of human-related factors from the front-line staff and technical staff. Commercial banks should set up a well-trained system of banking staff to provide care, advice, and support to customers with high personalization, dedication, and attention. On the other hand, as the providers of a mobile banking app, commercial banks should work closely with the telecommunication companies to design an app that is not only beautiful but also ensures quick and smooth transaction processing with high security and confidentiality.

This study has some limitations. First, this research focuses only on the impacts of service quality dimensions on customer satisfaction with mobile banking services. Meanwhile, the literature suggests that there may exist other factors that can influence customer satisfaction. In addition, the effect of demographic and geographic factors that may have an association with mobile banking satisfaction are not examined. Moreover, the final sample implies some sampling biases as a result of the convenience sampling method and the selection of Hanoi city as the only venue for data collection. The last but not least, some banks are not in the survey because the situation of Covid 19 pandemic so the authors face difficulties in assessing them. Future research could either expand this research model with more independent variables and control variables or revisit this study by using a larger sample size with better representativeness. Further, a longitudinal study on this topic is also interesting since the expectation and perception of mobile banking service experience may change over time as they become more familiar with the app.

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