Research Paper

# Factors Affecting Individual Customer's Satisfaction on the Mobile Banking Service Quality During Covid-19 Pandemic Period: The Case of Vietnam

## Tran Thi Quynh Trang[1], Truong Duc Anh Hieu[2], Dau Thi Huyen[3], Hoang Quynh Huong[4], Nguyen Thu Phuong[5], Tran Thi Thuy An[6], Le Thanh Tam[7]

[1,2,3,4,5,7] (School of Banking and Finance, National Economics University, Vietnam)
[6](Transaction Office, State Bank of Vietnam)

Corresponding Author: Le Thanh Tam

## ABSTRACT

This paper is aimed at analysing the factors affecting individual customer satisfaction with the mobile banking service quality during Covid-19 period in Vietnam. The methodology applied including SERVQUAL model, using e-SQ scale with EFA model. Data were collected from 405 observations answered via online survey of individuals using mobile banking service in period Jan-March 2022. Key findings of the research include: First, five factors affecting the positive customer satisfactions on mobile banking are ranked from highest to lowest impacts includes: Covid-19 pandemic, security, convenience/utility, empathy and responsiveness, and service fees. Second, Covid-19 pandemic provided the great opportunity for expanding mobile banking services, and Vietnamese banks have utilized this opportunity well by applying various promotion policies for encouraging more clients using mobile banking services. The digital transformation of banks enhances this process well. Third, the younger people have more satisfactions on mobile banking compared to older people, as the old have some difficulties in adapting to technological devices and softwares. Some recommendations have been proposed to improve the quality of mobile banking services for the new normal post-covid 19 pandemic period.

*Keywords: service quality, Covid-19, mobile banking, individual customers, satisfaction.*

## INTRODUCTION

The Covid-19 epidemic has had a significant impact on the world economy, particularly Vietnam. However, from a different perspective, the Covid-19 translation can be viewed as a catalyst for the financial system's digital transformation, particularly the creation of mobile banking services.

Mobile Banking enables commercial banks to offer packaged services via mobile application platforms, resulting in cost savings, reduced administrative and operational burdens, and increased operational productivity. Customers who use Mobile Banking can contact the bank at any time from any location, transact with high precision in a short amount of time, and save money. Customers can also instantly access and manage their bank accounts.

Many commercial banks have actively engaged in growing the Mobile Banking Service System, which is suited for our

country's digital transition and the Covid-19 epidemic phase, due to the benefits that Mobile Banking provides. Although it is still relatively new in Vietnam, Mobile Banking is and will become one of the most important banking services as science and technology, information technology, and telecommunications advance. In the future, commercial goods will be available.

That is why this study on "*Factors affecting individual customer's satisfaction on the Mobile Banking service quality during Covid-19 pandemic period: The case of Vietnam*" is carried out.

## LITERATURE REVIEW

There have been some research works on customer satisfaction and service quality in banking sector, such as the relationship between customer satisfaction with e-banking quality or internet banking quality, the factor affecting customer satisfaction and customer loyalty. ... When analysing the online communities: satisfaction and continued use intention, Christian & France (2017) confirmed that there was a positive relationship between information security and customer satisfaction. According to Thai Thanh Ha & Ton Duc Sau (2007), Duong Tri Thao & Nguyen Hai Bien (2011), convenience and price structure have a favorable impact on customer satisfaction. P.Gerrard & J.Cunningham (2015) found out that satisfaction with the quality of internet banking services focused on the following factors: availability, ease of use, reliability, response time, safety, service situation, and personnel quality. In particular, reliability and response are also mentioned in the research of Nguyen Hong Quan (2019), in addition to other factors: the ability to respond, electronic means, service capacity, translation costs with a relatively uneven impact level. Tam T.Le et al (2021) analyzed the impacts of mobile banking apps on bank performance using secondary data of commercial banks.

In general, studies basically clearly state and concretize factors affecting customer satisfaction about the quality of service. However, there are not many studies to analyze this relationship with the impacts of Covid-19 pandemic, and the significant change of factors affecting customer satisfaction and Mobile Banking quality.

## THEORETICAL MODELS OF SERVICE QUALITY
### The GAP model of service quality
### SERVQUAL Model

American academics, Mr. Zeithaml VA Parasuraman & LB Leonard have proposed 10 determinants of service quality from the customer's point of view and consider them as 10 criteria to evaluate service quality from the customer's point of view. However, due to certain overlaps, scholars have reduced from ten criteria to five criteria and abbreviated to RATER service quality evaluation criteria including: Reliability, Assurance, Tangibles, Empathy, and Responsiveness. According to the above 5 criteria, depending on specific fields, people try to define criteria to measure service quality by specific numbers.

Based on the view that: "Service quality is the gap between customers' expectations (expectations) and their perceptions (perceptions) when they have used the service". Parasuraman et al. (1985) built a service quality assessment model based on the analysis of service quality gaps, called the SERVQUAL model.

Accordingly, service quality is determined as follows:

Service quality = Perceived level – Expected value.

Parasuraman et al. confirmed that SERVQUAL is a reliable and accurate service quality measurement tool and that this scale has been widely used (Buttle, 1996; Robinson, 1999).

### The e-SQ model

Parasuraman et al. (2005) suggest that the customer's assessment of the service quality of a website includes not only the experience

of interacting with the website but also the service aspect. interactive services (i.e., performance commitments, benefits). Thus, the e-SQ model is defined to include all stages of a customer's interaction with a website: the extent to which a website facilitates selection, purchase, and delivery. row. The e-SQ model is a model used to measure the quality of online services. It includes two scales: (1) E-SQUAL includes 4 components with 22 observed variables, including Performance Component, Performance Commitment, System Availability, and Confidentiality. (2) E-RecS-QUAL which includes 3 components with 11 observed variables, including Response, Compensation, and Contact (Zeithaml, Parasuraman & Malhotra, 2000). The e-SQ model is a proven e-service quality measurement model in the field of e-banking in Sweden (Nhung, Tung, & Thao, 2020).

From previous studies, the authors decided to use the five-gap model and the e-SQ model for e-banking to measure the quality of Mobile Banking services, during the Covid-19 period, which requires further research. The study also tests the model with caution because some variables in the scale can change.

## RESEARCH METHOD AND HYPOTHESES

### *Impact factors and hypotheses*

Based on a research overview from previous studies, the authors chose to study the factors affecting individual customer satisfaction on Mobile bank service quality in the period of Covid-19 pandemic. Six factors are derived from serqual model and added the new factor -Covid-19. They include: (1) Empathy and responsiveness, (2) Convenience, (3) Service fee, (4) Security, (5) Covid-19 pandemic, (6) Satisfaction. The factors affecting individual customers' satisfaction with the quality of Mobile Banking services during the Covid-19 period and hypotheses are summarized in the following table:

**Table 1. Proposed factors affecting individual customer satisfactions on mobile banking service quality during covid-19 pandemic and hypotheses**

| Name of factors | References | Research hypothesis |
|---|---|---|
| Empathy and responsiveness | Nguyen Hong Quan (2019), Parasuraman et al (1988), Gerrard & Cunningham (2015), | + |
| Convenience | Thai Thanh Ha & Ton Duc Sau (2007), Duong Tri Thao & Nguyen Hai Bien (2011) | + |
| Service fee | Woo & Henry (1999), Thai Thanh Ha & Ton Duc Sau (2007), Pham Duc Ky & Bui Nguyen Hung (2007), Duong Tri Thao & Nguyen Hai Bien (2011) | + |
| Security and Security | Christian & France (2017), Elliot & Fowell (2000); Szymanski & Hise (2000) | + |
| Covid-19 pandemic | Consultation with banking experts | + |
| Satisfaction | Parasuraman et al. (1988), Nguyen Hong Quan (2019) | |

*Source: Authors' summary from literature review*

## Factor 1: Empathy and Responsiveness (DC)

Empathy is the focus of attention on customers to ensure care and distinction for them. Customer service is considered an important factor to help satisfy customers psychologically and increase trust, loyalty, and reliability. Banks can lose customers if there is a lack of empathy from within service providers.

Responsiveness will refer to the desire to assist customers in a respectful manner and provide prompt services that help satisfy customers. The response here will focus on two important factors that are readiness and quickness. Therefore, service providers need to ensure that their customers will receive services in the shortest time without delay. Don't make your customers think you don't care about them.

Responsiveness will be determined by how long the customer waits for answers or solutions from the service provider. The sooner a customer's problem is resolved, the faster the response will be.

**Hypothesis H1:** Responsive empathy has a positive impact on customer satisfaction.

### Factor 2: Convenience (TT)

Convenience in the transaction process is defined as the fact that a network service provider organizes a distribution channel to create convenience and ease in the transaction process. Choi et al (2008), confirmed that the convenience of the transaction process and an important variable affecting customer satisfaction. Besides, research by Thai Thanh Ha & Ton Duc Sau (2007), Duong Tri Thao & Nguyen Hai Bien (2011) have shown that convenience and customer satisfaction have a positive correlation.

**Hypothesis H2:** Convenience has a positive impact on customer satisfaction.

### Factor 3: Service fee (PDV)

According to Liu (2006), the price structure is related to service packages that businesses build for customers. Accordingly, the service price structure in this study is understood as the level of expenses paid to be able to use mobile telecommunications services. Research by Woo and Henry (1999), Thai Thanh Ha & Ton Duc Sau (2007), Pham Duc Ky & Bui Nguyen Hung (2007), Duong Tri Thao & Nguyen Hai Bien (2011) have shown that price structure has a positive affect customer satisfaction.

**Hypothesis H3:** Price structure has a positive impact on customer satisfaction.

### Factor 4: Security and security (BM)

The Vietnam Cybersecurity Law clearly states that cyber information security is the protection of information and information systems on the network from being accessed, used, disclosed, or intercepted. unauthorized deletion, modification, or destruction to ensure the integrity, confidentiality, and availability of information. This is also a requirement of users when participating in online banking services. According to Elliot & Fowell (2000); Szymanski & Hise (2000), as a perception of security risks decreases, satisfaction with information services of online stores is expected to increase. Christian and France (2017) reconfirmed the positive relationship between information security and customer satisfaction. Thus, ensuring the safety of customer information has a direct impact on the level of risk when transacting, contributing to an increase in service satisfaction.

**Hypothesis H4:** Security has a positive impact on customer satisfaction.

### Factor 5: "Covid-19 pandemic" (CV)

The Covid-19 outbreak has brought unprecedented challenges that require online service providers to have timely and reasonable solutions. to address the outstanding problems brought by the pandemic.

**Hypothesis H5:** The Covid-19 pandemic has a positive impact on customer satisfaction. Thus, when the pandemic broke out, people were restricted from going out. Therefore, they need a smart application to help them solve financial problems such as money transfers, purchases, ... Therefore, the more people translate, the more people see the sublimation development of this type of service.

### *The choice of research variables and information for each variable*

The research questions is built based on the research model presented above; is used to measure the factors affecting individual customer satisfaction on service quality of Mobile Banking: (1) Empathy and responsiveness, (2) Convenience, (3) Service fee, (4) Security, (5) Covid-19 pandemic. The scale to measure the impact of these factors on the satisfaction of individual customers residing in Vietnam. The type of scale used to measure the observed variables in the research model is a 5-point Likert scale with "1= strongly disagreed" and "5= strongly agreeing".

Details of components of each independent variable in the model are as follows:

**Table 2: Summary of components of each independent variable**

| Factor name | Independent variable |
|---|---|
| **Empathy and Responsiveness (DC)** | DC1: Bank staff is always ready to assist you 24/7 when you have questions about the service. |
| | DC2: Bank staff always monitor and understand customer service needs. |
| | DC3: The attitude of bank staff is always good to you when there are problems to be solved. |
| | DC4: The survey bank assesses customer satisfaction after each transaction. |
| | DC5: The Bank proactively notify promptly when there is a change in Mobile Banking service. |
| | DC6: Quick service troubleshooting time. |
| | DC7: The bank always informs you when a service is performed. |
| **Convenience (TT)** | TT1: Fast transaction time. |
| | TT2: The transaction is simple. |
| | TT3: Flexibility in linking with e-wallets. |
| | TT4: Easily find your bank's policies and notices. |
| | TT5: The transmission line is not congested during the transaction. |
| **Service Fee (PDV)** | PDV1: The bank's fees are reasonable for you. |
| | PDV2: You are satisfied that the money transfer is free. |
| | PDV3: Mobile Banking service fee is always stable. |
| **Security (BM)** | BM1: You trust that your personal information is always kept safe and secure. |
| | BM2: The bank blocks the account and warns of suspected attacks. |
| | BM3: Multi-layer security when making transactions (OTP code, biometric, ..). |
| | BM4: You trust personal information not to be misused. |
| | BM5: You feel safe when transacting with Mobile Banking. |
| **Covid-19 pandemic (CV)** | CV1: Mobile Banking expanded many utility services during the Covid-19 epidemic period. |
| | CV2: Services are regularly updated during the Covid-19 epidemic period. |
| | CV3: Mobile Banking provide more incentives, accumulate bonus points, and discount codes to support you during the Covid - 19 |
| | CV4: The services that Mobile Banking provides are absolutely necessary and ensure safety during the Covid-19 epidemic period. |

*Source: Authors' development from literature review*

### Questionnaire design

The survey questionnaire is designed into two parts:

Part 1: Includes information of survey respondents (gender, occupation, income level, age, ...) for the purpose of providing descriptions. provide an overview of the survey subjects and help interpret the results of data analysis.

Part 2: Survey on factors: empathy and responsiveness, utility, service fee, security, Covid-19 pandemic, and individual customer satisfaction designed on a Likert scale from 1 to 5, there are 06 groups and 30 questions.

### Research sample

The interviewees of the study are individual customers who are residing in Vietnam and using Mobile Banking services, focusing on the group of people from teenagers and older (from 15 years old and above).

The research team sent out the survey via an online form via social networks (with a link to the questionnaire built with the Google Forms tool). Total 435 answers have been recorded, of which 30 have missing data.

After cleaning the data, the research team keep 405 observation for analysis.

After the survey period, the research team will filter the eligible survey questionnaires, encrypt them on Excel software, and then put them into SPSS 20 software for analysis.

### Data analysis methods

The analysis method includes the following contents:

*Descriptive statistics*

Descriptive Statistics are the coefficients to describe the overall characteristics of the survey results. The descriptive statistical analysis presents central trends and measures of dispersion for all raw data. Thus, descriptive statistics allows the data to be presented in a more meaningful way, allowing for a simpler interpretation of the data.

*Test reliability by Cronbach's Alpha coefficient*

Reliability test to measure the reliability of the scale, and at the same time know the degree of a close correlation between observed variables belonging to the same factor in the model research.

*Exploratory Factor Analysis (EFA)*

(EFA) is a method that is performed immediately after the reliability test of the measurement scale (Cronbach's Alpha) is completed. This method helps to determine the appropriate and important sets of observed variables for the study based on the analysis of the linear relationship between the factors in the model and the observed variables. At the same time, EFA is also used to find out the relationship between variables.

*Analysis of linear correlation and multiple linear regression*

Linear correlation analysis
After evaluation, the satisfactory scales will continue to be included in the Pearson correlation analysis. The purpose of running the Pearson correlation is to check the close linear correlation between the dependent variable and the independent variables and identify the problem of multicollinearity when the independent variables are also strongly correlated with each other.

Multiple Linear Regression Analysis
Model represents the relationship between independent variables and a quantitative dependent variable. After confirming that two variables have a linear relationship with each other, we can model this relationship by the linear regression method.
*One-Way ANOVA*
One-way ANOVA is used to analyze the difference between the mean values of the dependent variables. One-factor variance compares the mean of two or more independent groups to determine if there is a difference between them.

## RESEARCH RESULTS AND DISCUSSIONS
### Descriptive and discuss statistics of the research sample
This survey was conducted in an online form on a wide scale across Vietnam and mainly within Hanoi city and survey respondents. Most are individual customers who use and care about the quality of Mobile Banking services. Demographic information of the sample is illustrated in detail in *Table 2.2*

**Table 3: Demographic information of the sample**

| Characteristics | | Sample Capacity (n=405) | | |
|---|---|---|---|---|
| | | Frequency | Ratio (%) | Accumulation (%) |
| Gender | Male | 186 | 45.9 | 45.9 |
| | Female | 219 | 54.1 | 100.0 |
| Age | Under 18 years old | 11 | 2.7 | 2.7 |
| | 18-25 years old | 162 | 40.0 | 42.7 |
| | 25-40 years old | 170 | 42, 0 | 84.7 |
| | Over 40 years old | 62 | 15.3 | 100.0 |
| Occupation | Students | 94 | 23.2 | 23.2 |
| | Office workers | 90 | 22.2 | 42.0 |
| | Government employees | 73 | 18.0 | 63.5 |
| | Workers, unskilled workers | 55 | 13.6 | 77.0 |
| | Self-employed | 79 | 19.5 | 96.5 |
| | Housewife | 7 | 1.7 | 98.3 |
| | Others | 7 | 1.7 | 100.0 |
| Income/Monthly Allowance | Under 3 million | 50 | 12.3 | 12.3 |
| | From 3 to 5 million | 80 | 19.8 | 32.1 |
| | From 5 to 10 million | 130 | 32.1 | 64.2 |
| | From 10 to 20 million | 90 | 22.2 | 86.4 |
| | Over 20 million | 55 | 13 ,6 | 100.0 |
| Frequency of use | Rarely: less than 3 times/week | 125 | 30.9 | 30.9 |
| | Occasionally: 3 - 5 times/week | 170 | 42.0 | 72.8 |
| | Frequently: more than 5 times/week | 110 | 27 ,2 | 100.0 |

*Source: Authors' compilation from primary data*

## *Descriptive statistics of factors affecting individual customer satisfaction*

**Table 4: Descriptive Statistics results of variables**

| Factor | Observation Code | Content | Standard deviation | Mean | Average |
|---|---|---|---|---|---|
| Empathy and responsiveness (DC) | DC1 | Bank staff is always ready to assist you 24/7 when you have questions about the service | 0.829 | 4.02 | 3.91 |
| | DC2 | Bank staff always monitor and understand customer service needs | 0.860 | 3.78 | |
| | DC3 | The attitude of bank staff is always good to you when there are problems to be solved | 0.811 | 3.91 | |
| | DC4 | The survey bank assess customer satisfaction after each transaction | 0.897 | 3.7 | |
| | DC5 | The Bank proactively notify promptly when there is a change in Mobile Banking service | 0.886 | 3.98 | |
| | DC6 | Quick service troubleshooting time | 0.836 | 3.72 | |
| | DC7 | The bank always informs you when a service is performed | 0.791 | 4.28 | |
| Convenience (TT) | TT1 | Fast transaction time | 0.759 | 4.22 | 4.12 |
| | TT2 | The transaction is simple | 0.713 | 4.3 | |
| | TT3 | Flexibility in linking with e-wallets | 0.812 | 4.18 | |
| | TT4 | Easily find your bank's policies and notices | 0.792 | 4.1 | |
| | TT5 | The transmission line is not congested during the transaction | 0.85 | 3.79 | |
| Service Fee (PDV) | PDV1 | The bank's fees are reasonable for you | 0.892 | 3.72 | 3.89 |
| | PDV2 | You are satisfied that the money transfer is free | 0.837 | 4.19 | |
| | PDV3 | Mobile Banking service fee is always stable | 0.841 | 3.89 | |
| Security (BM) | BM1 | You trust that your personal information is always kept safe and secure | 0.784 | 3.88 | 3.94 |
| | BM2 | The bank blocks the account and warns of suspected attacks | 0.846 | 3.86 | |
| | BM3 | Multi-layer security when making transactions (OTP code, biometric, ..) | 0.783 | 4.17 | |
| | BM4 | You trust personal information not to be misused | 0.85 | 3.82 | |
| | BM5 | You feel safe when transacting with Mobile Banking | 0.788 | 3.99 | |
| Covid-19 pandemic (CV) | CV1 | Mobile Banking expanded many utility services during the Covid-19 epidemic period. | 0.82 | 4.12 | 4.05 |
| | CV2 | Services are regularly updated during the Covid-19 epidemic period. | 0.814 | 4.03 | |
| | CV3 | Mobile Banking provide more incentives, accumulate bonus points, and discount codes to support you during the Covid-19 pandemic | 0.811 | 3.93 | |
| | CV4 | The services that Mobile Banking provides are absolutely necessary and ensure safety during the Covid-19 epidemic period | 0.808 | 4.10 | |
| Satisfaction (HL) | HL1 | You are satisfied with the transaction processing speed of Mobile Banking | 0.768 | 4.04 | 4.05 |
| | HL2 | You are satisfied with the services, utilities provided | 0.750 | 4.08 | |
| | HL3 | Make the right decision when using Mobile Banking service | 0.729 | 4.11 | |
| | HL4 | Mobile Banking provides the service as expected | 0.741 | 3.98 | |
| | HL5 | Overall, you are satisfied with the quality of Mobile Banking service | 0.700 | 4.01 | |
| | HL6 | You will recommend to acquaintances to use Mobile Banking | 0.774 | 4.07 | |

*Source: Authors' compilation from primary data*

The observed variables all have standard deviation values in the range of 0.7 - 1, which means that with 405 survey participants, the difference is the rating score according to the Likert scale of 5 points can be considered relatively high. It can be seen that individual customers participating in the survey have approached and used Mobile Banking regularly, so they can make objective comments about the service quality they perceive.

Looking at the results of the average value of the questions in the survey which are evaluated on the 5-point Likert scale, it can be seen that the statements related to the factors affecting the quality of Mobile Banking services are relatively high ratings. The question "A survey bank assesses customer satisfaction after each transaction: [4. Empathy and responsiveness]" achieved an average of 3.70 points, which is neutral, which is also the lowest average value in the scale of factors. It can be commented that customers participating in the survey have a relatively high level of satisfaction with Mobile Banking.

### *Reliability test by Cronbach's Alpha*

Following is the result of Cronbach's Alpha coefficients:

**Table 5: Cronbach's Alpha coefficients of the model**

| Observed variables | Number of variables | Cronbach's Alpha | Variable correlation coefficient – minimum sum |
|---|---|---|---|
| Empathy and responsiveness | 7 | 0.855 | 0.612 |
| Convenience | 4 | 0.817 | 0.563 |
| Service Fee | 3 | 0.763 | 0.523 |
| Security | 5 | 0.820 | 0.540 |
| Covid-19 pandemic | 4 | 0.895 | 0.744 |
| Satisfaction | 6 | 0.909 | 0.692 |

*Source: Authors' compilation from primary data*

### *Exploratory factor analysis (EFA) results*

After 2 times of running exploratory factor analysis (EFA), we have the result table of the 2nd Component Matrix as follow:

The research team opted to exclude the four observed variables DC7, TT4, TT5, and BM3 after verifying the variables' reliability and conducting two EFA analyses because the observed variables did not fit the model. The findings of the Barlett test, which had a sig of 0 (0.005) and a KMO coefficient of 0.929 (>0.5), extracted variance of 67.225 percent > 50%, met the requirements. There will be five independent variables in the regression model.

**Table 6: EFA results of the model**

| | Component | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| DC2 | .736 | | | | |
| DC1 | .704 | | | | |
| DC4 | .631 | | | | |
| DC6 | .629 | | | | |
| DC3 | .614 | | | | |
| DC5 | .601 | | | | |
| CV2 | | .809 | | | |
| CV3 | | .774 | | | |
| CV4 | | .759 | | | |
| CV1 | | .749 | | | |
| BM4 | | | .792 | | |
| BM1 | | | .721 | | |
| BM5 | | | .714 | | |
| BM2 | | | .605 | | |
| TT2 | | | | .766 | |
| TT1 | | | | .725 | |
| TT3 | | | | .724 | |
| PDV1 | | | | | .816 |
| PDV3 | | | | | .721 |
| PDV2 | | | | | .582 |

*Source: Authors' compilation from primary data*

**Table 7: New factors formed after the EFA results**

| Factor | Observable variables |
|---|---|
| Empathy and Response (DC) | DC1, DC2, DC3, DC4, DC5, DC6 |
| Convenience (TT) | TT1, TT2, TT3 |
| Service Fee (PDV) | PDV1, PDV2, PDV3 |
| Security (BM) | BM1, BM2, BM4, BM5 |
| Covid-19 pandemic (CV) | CV1, CV2, CV3, CV4 |

*Source: Authors' compilation from primary data*

We have a table of Cronbach's Alpha coefficients of observed variables after exploratory factor analysis EFA:

**Table 8: Cronbach's Alpha coefficients after EFA**

| Observed variables | Number of variables | Cronbach's Alpha | Variable correlation coefficient - minimum sum |
|---|---|---|---|
| Empathy and responsiveness | 6 | 0.835 | 0.520 |
| Convenience | 3 | 0.811 | 0.633 |
| Service fee | 3 | 0.763 | 0.523 |
| Security | 4 | 0.805 | 0.562 |
| Covid-19 pandemic | 4 | 0.895 | 0.744 |
| Satisfaction | 6 | 0.909 | 0.692 |

*Source: Authors' compilation from primary data*

## Pearson correlation analysis results

We have a table of results of Pearson correlation analysis:

**Table 9: Pearson correlation results**

| Pearson correlation | | HL | DC | CV | BM | TT | PDV |
|---|---|---|---|---|---|---|---|
| HL | Pearson correlation | 1 | .660** | .680** | .667** | .674** | .606** |
| | Sig, (2-tailed) | | .000 | .000 | .000 | .000 | .000 |
| | N | 405 | 405 | 405 | 405 | 405 | 405 |
| DC | Pearson correlation | .660** | 1 | .603** | .566** | .572** | .533** |
| | Sig, (2-tailed) | .000 | | .000 | .000 | .000 | . 000 |
| | N | 405 | 405 | 405 | 405 | 405 | 405 |
| CV | Pearson correlation | .680** | .603** | 1 | .511** | .558** | .558** |
| | Sig, (2-tailed) | .000 | .000 | | .000 | .000 | .000 |
| | N | 405 | 405 | 405 | 405 | 405 | 405 |
| BM | Pearson correlation | .667** | .566** | .511** | 1 | .551** | .534** |
| | Sig, (2-tailed) | .000 | .000 | .000 | | .000 | .000 |
| | N | 405 | 405 | 405 | 405 | 405 | 405 |
| TT | Pearson correlation | .674** | .572** | .558** | .551** | 1 | .545** |
| | Sig, (2-tailed) | .000 | .000 | .000 | .000 | | .000 |
| | N | 405 | 405 | 405 | 405 | 405 | 405 |
| PDV | Pearson correlation | .606** | .533** | .558** | .534** | .545** | 1 |
| | Sig, (2-tailed) | .000 | .000 | .000 | .000 | .000 | |
| | N | 405 | 405 | 405 | 405 | 405 | 405 |

*Source: Authors' compilation from primary data*

After obtaining Cronbach's Alpha test results and EFA exploratory factor analysis, the research model has 5 independent variables. The research team used Pearson's correlation coefficient to evaluate the correlation relationship between the variables in the model.

The specific results are analyzed as follows:

Sig Pearson correlation of independent variables DC, CV, BM, TI, and PDV with dependent variable HL are all less than 0.05. Thus, there is a linear relationship between these 5 independent variables and the HL variable. There is a strong correlation between CV and HL with r coefficient of 0.680. Between PDV and HL has the weakest correlation with r coefficient of 0.606. The correlation coefficient r has a value of r > 0 showing that the variables have a positive relationship with each other.

Correlation coefficient of the variable "Empathy and responsiveness" and 2 variables "Convenience"; "Covid-19 pandemic" is 0.572 and 0.603 respectively, so the variable "Empathy and responsiveness" is quite closely correlated with "Convenience"; "Covid-19 pandemic".

The correlation coefficient of the variable "Security" and the variable "Covid-19 pandemic" is 0.551, which showed that these two variables have a linear relationship in the same direction. In general, the independent variables in the model are quite closely correlated with each other.

## Results of regression analysis and hypothesis testing

The coefficient $R^2$ (R-Square) is 0.680, which is significant. We also have Durbin - Watson = 1.991 - reaching the required value.

Hypothesis testing about the overall fit of the model, value F= 166.173 with sig.=0.000 < 0.05. That is, the linear regression model built is suitable for the whole.

**Table 10. Regression result analysis**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Tolerance | VIF |
| 1 | (Constant) | .255 | .133 | | 1.925 | .055 | | |
| | PDV | .096 | .033 | .110 | 2.909 | .004 | .559 | 1.790 |
| | DC | .165 | .039 | .169 | 4.239 | .000 | .502 | 1.991 |
| | TT | .223 | .037 | .235 | 6.042 | .000 | .532 | 1.878 |
| | CV | .223 | .034 | .257 | 6.542 | .000 | .522 | 1.916 |
| | BM | .240 | .036 | .252 | 6.659 | .000 | .560 | 1.786 |

*Source: Authors' compilation from primary data*

Consider the variance magnification factor VIF to check for multicollinearity. According to Table 4.18, the VIF coefficients of all 5 factors are < 2, inferring no multicollinearity between the independent variables.

The normalized regression model is rewritten as follows:

**HL = 0.110 \*PDV + 0.169\*DC + 0.235\*TT + 0.257\*CV + 0.252\*BM**

All five independent variables "Covid 19 pandemic," "Empathy and responsiveness," "Convenience," "Service price," and "Security" had a positive impact on satisfaction with Mobile Banking service quality, according to the above regression model. The level of impact is arranged in descending order as follows: "Covid 19 pandemic" ($\beta$ = 0.257); "Security" ($\beta$ = 0.252); "Convenience" ($\beta$ = 0.235); "Empathy and responsiveness" ($\beta$ = 0.169) and "Service fee" ($\beta$ = 0.110).

***Differences by age status affects the satisfaction of individual customers with the quality of Mobile Banking service***

To test the difference in age status to satisfaction, the research team uses analysis by One-Way ANOVA. Analytical results from the obtained data:

Levene test for P-value greater than 0.05 shows that the variances of the groups of values are identical, so the results of the ANOVA table should be used.

**Table 11. Results of the analysis of differences by age status**

| Check for homogeneity of variances | | | | | |
|---|---|---|---|---|---|
| | | Levene Statistics | df1 | df2 | Significance level |
| HL | Mean | 0.737 | 3 | 401 | .531 |

| ANOVA | | | | | |
|---|---|---|---|---|---|
| HL | | | | | |
| | Sum of squares | Df | Mean square | F | Level of significance |
| Between groups | 5.185 | 3 | 1.728 | 4.666 | .003 |
| Within the same group | 148.527 | 401 | .370 | | |
| Total | 153.712 | 404 | | | |

*Source: Authors' compilation from primary data*

Significance level = 0.003 < 0.05, inferring that people of different age groups have different levels of satisfaction with the quality of Mobile Banking services.
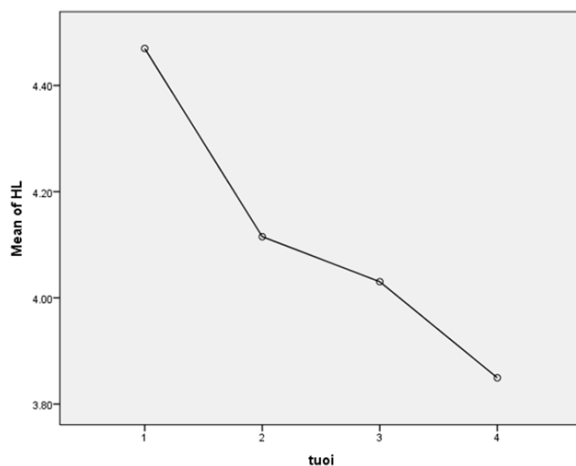


*Source: Authors' compilation from primary data*

**Figure 1: Average value by age**

The chart shows that customers who participated in the survey under the age of 18 have the highest level of satisfaction about the quality of Mobile Banking services. Customers aged 18-25 have the second highest level of satisfaction with Mobile Banking. Customers in the age group from 25-40 years old have the third highest level of satisfaction with Mobile Banking service quality and higher than those over 40 years old. It can be seen that young customers easily accept and use modern technology-related products and services; In addition, older customers often have difficulty using technology services and have higher requirements and expectations for service quality than younger people.

## RESULT & DISCUSSION

Following are the main discussion results on each factor.

### Covid-19 pandemic

The Covid-19 pandemic is the factor that has the strongest impact on customer satisfaction. With the coefficient β = 0.257, it can be concluded that the Covid-19 pandemic period has a positive impact on user satisfaction about the quality of Mobile Banking services. In order to help customers overcome difficulties during the pandemic, many banks have quickly and promptly launched policies to support and create many accumulation and reward programs to encourage the use of Mobile Banking. Moreover, the Covid-19 pandemic has also made online banking more urgent than ever, thus increasing customer satisfaction.

### Security

Security is the second most influential factor affecting the satisfaction with the quality of Mobile Banking service of users (β = 0.252). Empirical studies have also produced similar results, Christian and France (2017) have reconfirmed the positive relationship between information security and customer satisfaction. Other studies by Brown et al (2003); Luarn and Lin (2005); Laforet and Li (2005); Yang (2009) also reached the same conclusion about the risk of customer satisfaction in using services. Therefore, in order to improve customer satisfaction, banks need to strengthen the protection of information about customers' mobile payment transactions, regularly recommend and guide customers on risk prevention measures such as: PIN code, access password, ... to increase customer understanding, transaction experience and information related to security issues.

### Convenience

Research results show that convenience has a significant direct impact on customer satisfaction about the quality of Mobile Banking services (β = 0.235). This result is consistent with previous research by Choi et al. (2008), Duong Tri Thao and Nguyen Hai Bien (2011) who also showed a positive relationship between convenience and customer satisfaction. Users will be extremely satisfied with the quality of Mobile Banking service if the system responds quickly and at the right time when customers have needs: all transactions when needed will be done immediately, operations on the system are easy for customers. For all ages, the system is not overloaded or interrupted when the number of users increases (especially on holidays and Tet). Therefore, banks need to provide accurate Mobile Banking services with high speed and ensure safety and stability for the whole system (Yuan et al., 2016).

### Empathy and responsiveness

Empathy and responsiveness with β = 0.169 have a positive impact on customer satisfaction about the quality of Mobile Banking services. This factor helps to bridge the gap between the Mobile Banking application and the use of the service by customers. The ability to respond to Mobile Banking services is reflected in: being ready to help customers use e-banking services and providing quick support services (Sakhaei et al., 2013), (Gerrard & Cunningham, 2015). If the Mobile Banking service does not meet users' expectations in terms of such aspects as goodwill, willingness to support, and answer questions, customers will not feel well served. Therefore, banks need to build a consistent business process, not to lose customers' waiting time. Besides, the bank providing Mobile Banking can provide personalized services to meet the needs of users as suggested by some researchers such as Yuan et al (2016) and Ofori et al. the (2017).

### Service fee

Service fee also has a positive impact on customer satisfaction. With the coefficient β = 0.110, the service fee is the factor with the lower influence than the other independent variables. Previous studies by Woo and Henry (2007), Duong Tri Thao and Nguyen Hai Bien (2011) also show that service prices have a positive impact on customer satisfaction. of customers. However,

according to the research team's results, the service fee factor has little influence on individual customer satisfaction, this result is different from previous studies. According to Luarn and Lin (2004), Nguyen Hong Quan (2020), Duong Tri Thao and Nguyen Hai Bien (2011), service fees are one of the biggest concerns in the application of services, from that affects the level of individual customer satisfaction. The research team's results are reasonable because during the Covid-19 pandemic, many banks have applied free domestic payments inside and outside the system, and maintenance fees are always collected at a stable rate, reasonable for all customers, including students. Therefore, the service fee was not the main concern of the client during the research period.

## RECOMMENDATIONS

To improve the quality of mobile banking services and increase the satisfactions of individual clients, related stakeholders should take more active actions as follow:

### *To commercial banks*

### *Developing policies during and after the Covid-19 pandemic*

Banks should strengthen guidelines for utilizing electronic services for all customers from young to middle-aged. Furthermore, in the context of the pandemic, the banks' efforts in this direction acquire new dimensions, as they should be predominantly performed online, which also implies the increase of users' digital skills. Against this background, offering online tutorials to familiarize customers with the use of digital channels is a necessity, especially for customers with few skills in the field or for those who are reluctant to use such alternatives. Banks may create marketing campaigns to encourage the use of online channels, because the collaboration with Fintech will allow them to give digital solutions adapted to the consumer's specific usage.

In addition to the policies that banks are implementing during the Covid-19 epidemic,

banks should take into consideration in the following post Covid-19 pandemic stage to closely monitor the needs and perception of customers because it is very possible that a large amount of them will continue to use this new interface despite the recovering of the bank's full functionality with traditional banking

### *Improving the security level of Mobile Banking*

Security is a critical aspect affecting the satisfaction of Mobile Banking users. Commercial banks need to have an electronic security system to safeguard the bank's safety and prevent client data from being compromised when using it. Simultaneously, banks should produce alternative strategies suited to different age groups or male and female clients, which increase their trust that using Mobile Banking is safe and secure. Furthermore, commercial banks must be selective and thorough organizing employees to manage and safeguard Mobile Banking system.

Commercial banks need to develop a long-term strategy to increase customers trust in the security and safety of Mobile Banking services, such as improving financial transaction security and providing assurance statements, using appropriate marketing and communication strategies to raise customers' awareness of information security in the network environment. For example, banks may include a "Frequently Asked Questions and Answers" section relating to Mobile Banking security and proper use of the system to educate customers in protecting themselves and ensuring the safety of Mobile Banking services, especially cyber attacks. Furthermore, banks should establish a staff of devoted and disciplined information security officers to prevent collaboration with cybercriminal, since one of the factors that may lead to client fear of cyberattacks is employee's morale.

### *Enhancing the convenience of Mobile Banking for customers*

According to the study's findings, convenience has a significant influence on

customer happiness. In order to satisfy the expectations of clients, Mobile Banking applications need to be highly networked. Moreover, the bank must expand its network and collaborate with other commercial organizations to invest in the electronic payment system to meet the highest payment needs of customers. Banks need to customise utilities meet the demands of each consumer segment. Besides, banks should support product research and development, provide the groundwork for products with increasingly high-tech applications, integrate numerous features, and work toward related product bundles, cross-selling the entire bank, and so on. At the same time, the bank continues to simplify the procedures while assuring the safety, accuracy, and speed of transactions.

### Increase the bank's empathy and responsiveness to customers

The empathy and responsiveness is a crucial factor in bridging the gap between the bank's Mobile Banking application and the lives of its consumers. The bank has to increase the human resource level as well as designate adequate individuals to satisfy the need of customers in a timely way; especially, the bank requires a dedicated staff to execute the Mobile Banking service.

Banks must also understand their customers' expectations for Mobile Banking by providing accurate information about the advantages and costs of utilizing the service; creating and keeping tight connections with consumers; and upgrading Mobile Banking services depending on their needs. In addition, enhance research and survey of customer demands to develop new services to fulfill consumers' transaction needs. Furthermore, banks can categorize clients and produce strategy appropriately in order to provide diverse services to fulfill the demands and wishes of various customer groups.

### Developing a reasonable service fee policy

As the research results demonstrate, service fee is the least influential element on individual customer happiness. It is appropriate because most banks are waiving or lowering various service costs for users during the study period. However, for services that the bank does not provide for free, fee collection must be competitive in order to be the best charge for both the consumer and the bank. For example, instead of charging for SMS service through carriers, banks may totally convert to balance notification via Mobile Banking application to save costs for clients while also assisting banks in pay carriers that provide SMS Banking services. Furthermore, the short-term charge policy is implemented flexibly in each period, such as giving preferred pricing to students, consumers who transact with high value, high usage density, and high-volume clients.

### For policymakers

The State Bank of Vietnam should issue more specific guidelines and standards for commercial banks in order to promote the growth of non-cash payments, as well as quickly complete the corridor regulations, ensuring security and safety in payment activities, allowing banks to apply innovations, applications, and new features to Mobile Banking services, enhancing the experience and improving customer satisfaction.The State Bank should also collaborate with the Ministry of Information and Communications to develop and implement financial communication and education programs for the general public so that they have all of the necessary information, skills, and peace of mind to use cashless payment services safely. Besides, The Vietnam Banks Association has to aggressively absorb opinions from commercial banks to report to the State Bank in a more timely way, to be alert to new local and international trends and challenges before developments of the Covid-19 pandemic. Furthermore, the government must encourage the development of infrastructure for mobile payment apps and eliminate network security concerns in order to improve service quality, satisfaction, and openness. Mobile banking's popularity is

growing.

## CONCLUSION

The elements influencing individual consumers' satisfaction with the quality of Mobile Banking services are not new topics in the present study area; nevertheless, many aspects remain unclear or unexplored. This study demonstrates that the feature "Covid-19 epidemic" has the most influence on individual customer happiness and the impact of demographic characteristics such as age and frequency of utilizing Mobile Banking service- a novel finding of the study. However, this study is limitted by various difficulties such as: analyzing just individual consumers, not investigating particular situations of each commercial bank in Vietnam, only stopping at considering the link between service quality and customer contentment, satisfaction, etc. These problems will be incorporated in other future researchs.

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## APPENDIX: SURVEY QUESTIONNAIRE

A. Personal information about respondents

1. Your gender
   - □ Male
   - □ Female

2. Your age is
   - □ Under 18 years old
   - □ 18-25 years
   - □ 25-40 years old
   - □ 40+ years old

3. Your current occupation
   - □ Student
   - □ Office worker
   - □ Public servants
   - □ Workers, unskilled workers
   - □ Self-employed
   - □ Housewives
   - □ Others

6. What is your monthly income (including allowance if any)?
   - □ Under 3 million VND
   - □ From 3 to 5 million VND
   - □ From 5 to 10 million VND
   - □ From 10 to 20 million VND
   - □ Over 20 million VND

5. Survey content

Based on your experiences in using Mobile Banking Please rate your satisfaction with the service quality of Mobile Banking on a scale of 1-5 in which:

   (1) Totally disagree
   (2) Disagree
   (3) Neutral
   (4) Agree
   (5) Totally Agree

| Content | Rating | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| **I. Empathy and Responsiveness** | | | | | |
| Bank staff are always ready to assist you 24/7 when you have questions about the service. | | | | | |
| Bank staff always monitor and understand customer service needs. | | | | | |
| The attitude of bank staff is always good to you when there are problems to be solved. | | | | | |
| The survey bank assesses customer satisfaction after each transaction. | | | | | |
| The Bank proactively notify promptly when there is a change in Mobile Banking service | | | | | |
| Quick service troubleshooting time | | | | | |
| The bank always informs you when a service is performed | | | | | |
| **II. Convenience** | | | | | |
| Fast transaction time | | | | | |
| The transactions is simple | | | | | |
| Flexibility in linking with e-wallets | | | | | |
| Easily find your bank's policies and notices | | | | | |
| The transmission line is not congested during the transaction | | | | | |
| **III. Service Fee** | | | | | |
| The bank's fees are reasonable for you | | | | | |
| Are you satisfied that the money transfer is free. | | | | | |
| Mobile Banking service fee is always stable | | | | | |
| **III. Confidentiality and security** | | | | | |
| You trust that your personal information is always kept safe and secure | | | | | |
| The bank blocks accounts and warns of suspected attacks | | | | | |
| Multi-layer security when making transactions (OTP code, biometric, ..) | | | | | |
| You trust personal information not to be misused | | | | | |
| You feel safe when transacting with Mobile Banking | | | | | |
| **IV. Covid-19 pandemic** | | | | | |
| Mobile Banking expanded many utility services during the Covid-19 epidemic period | | | | | |
| Services are regularly updated during the Covid-19 epidemic period | | | | | |
| Mobile Banking provides more incentives, accumulate bonus points, discount codes to support you during the Covid-19 pandemic | | | | | |
| The services that Mobile Banking provides are absolutely necessary and ensure safety during the Covid-19 epidemic period | | | | | |
| **V. Satisfaction** | | | | | |
| You are satisfied with the transaction processing speed of Mobile Banking | | | | | |
| You are satisfied with the services and facilities provided? | | | | | |
| Make the right decision when using Mobile Banking service | | | | | |
| Mobile Banking provides the service as expected | | | | | |
| Overall, you are satisfied with the quality of Mobile Banking service | | | | | |
| You will recommend to acquaintances to use Mobile Banking | | | | | |

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