

## CUSTOMER SATISFACTION IN DIGITAL BANKING SECTOR IN VIETNAM: A META-CASE APPROACH

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### ABSTRACT

As the digitalization of financial services increases, it is the customers who benefit, and the banks have more capacity to enhance the experience and digital satisfaction of their target customers. The paper focuses on an important issue of the Vietnamese banking system. It is the process of digital transformation through applying leading fintechs to their core banking platform. Therefore, the main objective of this research is to explore the possible relationship between customer satisfaction with digital banking services and the other observed variables due to the theory of SERVQUAL. This study reaffirms and adds to the measurement scale system of customer satisfaction concepts while experiencing digital banking services. This helps researchers in the banking sector of Vietnam and around the world have a scale to conduct their researches on customer satisfaction. The author also uses quantitative analysis for a random sample survey within the banking network of Northern region of Vietnam (290 samples in total). Descriptive analysis, reliability analysis of scale, exploratory factor analysis, or multiple regression analysis all provide better perspectives on the relationship between customer satisfaction and the digital services that banks are offering. The major findings of the study involve the fact that focusing on minimizing response time to customers' inquiries and individualizing services to each one of them are the things that the digital banks in Vietnam need to do beforehand. To conclude, the roles of tangibles and responsiveness in the digital banking services can only be examined much more thoroughly in the upcoming researches while this one cannot.

**Keywords:** Customer satisfaction; Customer loyalty; Digital bank; E-banking service; Vietnam

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## *Satisfacción del cliente en el sector de la banca digital en Vietnam: un enfoque de meta-caso*

### RESUMEN

A medida que aumenta la digitalización de los servicios financieros, son los clientes los que se benefician y los bancos tienen más capacidad para mejorar la experiencia y la satisfacción digital de sus clientes objetivo. El documento se centra en un tema importante del sistema bancario vietnamita. Es el proceso de transformación digital mediante la aplicación de fintechs líderes a su plataforma de banca central. Por lo tanto, el objetivo principal de esta investigación es explorar la posible relación entre la satisfacción del cliente con los servicios de banca digital y las demás variables observadas debido a la teoría de SERVQUAL. Este estudio reafirma y suma al sistema de escalas de medición los conceptos de satisfacción del cliente al experimentar los servicios de banca digital. Esto ayuda a los investigadores del sector bancario de Vietnam y de todo el mundo a tener una escala para realizar sus investigaciones sobre la satisfacción del cliente. El autor también utiliza un análisis cuantitativo para una encuesta de muestra aleatoria dentro de la red bancaria de la región norte de Vietnam (290 muestras en total). El análisis descriptivo, el análisis de confiabilidad de escala, el análisis factorial exploratorio o el análisis de regresión múltiple brindan mejores perspectivas sobre la relación entre la satisfacción del cliente y los servicios digitales que ofrecen los bancos. Los principales hallazgos del estudio involucran el hecho de que centrarse en minimizar el tiempo de respuesta a las consultas de los clientes e individualizar los servicios para cada uno de ellos son las cosas que los bancos digitales en Vietnam deben hacer de antemano. Para concluir, los roles de los elementos tangibles y la capacidad de respuesta en los servicios bancarios digitales solo pueden examinarse mucho más a fondo en las próximas investigaciones, mientras que esta no puede.

**Palabras Clave:** La satisfacción del cliente; La lealtad del cliente; banco digital; servicio de banca electrónica; Vietnam

### Introduction

According to the State Bank of Vietnam, the system of Vietnamese credit institutions includes 4 state-owned commercial banks, 31 joint stock commercial banks, 9 one-hundred-percent foreign owned banks, 2 joint venture banks, 2 banks for social policy, 1 cooperative bank, non-banking credit institutions (16 financial companies, 10 financial leasing companies, others), microfinance institutions, people's credit funds, 49 branches of foreign banks and 52 representative offices of foreign credit institutions (SBV, 2022). In that context, the competitive challenges are even more obvious. Domestic joint-stock commercial banks must compete with very modern and professional foreign banks. Besides the more diverse needs of customers, domestic banks must adopt the latest technology applications and must give birth to a new method of supplying products and services, which is conducted through electronic distribution channels and collectively referred to as "digital banking".

The advent of digital banking services has completely changed the relationship between customers and the banks (Mbama & Patrick, 2018). In the spreading wave of digital technology, banking business activities are also being greatly affected. There have been obvious changes. The process of digitizing communication between the bank and its

customers is being evaluated as one of the most important factors of digital transformation in Vietnamese banks today. This, then, has been reflected in improving customer experiences. The application of digital technology is an opportunity for banks to promote the development of suitable products and services and to provide the best customer journey.

Vietnamese people have changed their habits quickly. Instead of shopping directly, they use online shopping applications, which allow electronic payments. Therefore, customers are increasingly demanding, for they expect the Bank to provide transaction methods with convenient, safe, and enjoyable experiences (Trang, 2022). Therefore, many banks have constantly been developing and expanding customer electronic transaction channels. In addition, the banks have made several efforts to upgrade transaction channels to give customers a seamless experience no matter which communication channel they are up to. In overall, the trend of banking digitization in Vietnam is highly evident with positive changes in non-cash payments. Within the country, the digital banking is considered an opportunity, a challenge, and a driving force for social growth. It is also a tough requirement in the context of the strong development of information technology.

Many previous studies have also measured customer satisfaction with digital banking services, helping to create a pool of loyal customers that are essential to maintaining regular banking operations. However, this means that the banks are responsible for building and maintaining relationships with customers and making customers satisfied with e-banking services. Thus, banks need to be proactive in developing this type of relationship (Larsson & Yamit, 2017). In today's competitive environment, customers' satisfaction with digital banking services is the decisive factor for the existence of the banks. Any bank that holds customer satisfaction and loyalty will survive and even develop sustainably (Bagla & Vivek, 2018). This paper, in that sense, has addressed the prominent topic of customer satisfaction within the digitalized context of the banks in Vietnam. Its major objective is to explore the relationship between customer satisfaction and the observable factors regarding the different gaps in service delivery that the Vietnamese banks may bring to their individual clients.

## Literature Review

### Service and Service Quality

A service is a special product with many characteristics and is different from other kinds of goods. According to Kotler et al. (2017a), service includes four basic characteristics: intangibility, inseparability, volatility, and perishability.

- First, services are invisible. Unlike physical products, they cannot be seen, tasted, felt, heard, or smelled before purchasing them. To reduce the level of uncertainty, buyers will look for physical evidence of service quality, in which they infer the quality from the places, people, equipment, informational materials, symbols, and prices they may see.

- Second, services are produced and consumed at the same time. If the service is performed by one person, the individual is a part of that service. Since the customer is also present when the service is performed, the interaction between the service supplier and the customer is a distinctive feature of service marketing. This is when both the supplier and the customer affect the outcomes of the service.

- Third, services are very unstable. They depend much on the person who performs them and on when and where they are provided.

– Fourth, services cannot be stored for future use. The perishability will not be an issue as long as the demand is stable. When it fluctuates, the service companies may run into troubles because they have had to pay for the fixed costs of human resources and other physical settings.

In short, services are intangible products. However, many scholars still have different viewpoints on the service concept. According to Kotler and Keller (2016), a service is a type of activity or benefit provided in exchange that is essentially intangible and does not necessarily result in the transfer of any ownership. The performance of a service may or may not be tied to a physical product. According to Chaffey & Ellis-Chadwick (2019), services are products of labor that do not exist in physical form, whereas production and consumption processes occur simultaneously in order to meet customers' needs. According to Perreault et al. (2017), services are the behaviors, processes, and ways of doing a certain job to create value for customers and satisfy their needs and expectations.

The quality of products and services has long been a concern of many researchers globally. Service quality is often difficult to be defined. And there is no one-for-all effective management strategy. Service quality, in general, is a measure of how well the service delivered to the customers matches their expectations. Creating a quality service means meeting customer expectations consistently. The problem of perception, inspection, and quality control in services is a big problem for researchers. Actual quality and the factors that govern it have not been quantified till the present. The importance of service quality for businesses and customers is very different. Service quality strongly influences market share, return on investment, and labor productivity, lowering production costs and ultimately raising profits. These are all long-term strategic goals for service businesses (Bonaccorsi et al., 2011). We cannot use the method of physical goods inspection and quality control to apply to services because the latter have distinct characteristics that govern the formation process and movement of quality.

## **Customer satisfaction**

Satisfaction is the consumer's response to the fulfillment of wants. This definition implies that satisfaction is a positive status of consumers in consuming a product or service while it fulfills their wants, including the delighting degree beyond the desired level. According to Kotler et al. (2017b), satisfaction is the degree of an individual's sensory state resulting from comparing the results obtained from the product/service with that person's expectations and wishes. They may originate from personal needs, previous experiences and may be triggered by external information such as advertising, word of mouth from friends, relatives, and family members. Thus, the level of satisfaction correlates with the difference between received and expected results. Customers may have one of the following three levels of satisfaction: If the performance is worse than expected, the customer is dissatisfied; if the performance well matches the expectations, the customer is satisfied; If the actual benefits even exceed the expectations, the customer is delighted.

According to Muhammad et al. (2018), customer satisfaction is an emotional response by customers to their experiences with a product or service. Aries & Eirene (2015) said that the differences in the value of products and services that customers are receiving in comparison with the previous products and services will reveal customer satisfaction.

Similarly, Chayuth et al. (2015) stated that customer satisfaction is consumers' response to fulfilling their desires. Sharing the same view, Ganesh et al. (2021) stated that customer satisfaction is the assessment of customers of a product or service that meets their wants and preset requirements. This, in turn, specifies the concept of "customer satisfaction" as an assessment, measured against a product or service.

Due to Milner & Adrian (2017), there are two dimensions of satisfaction. Those are the customer satisfaction with the ended product (i.e. after consuming the product) and the customer satisfaction with the service delivery process (i.e. associated with the customer's entire product using experiences). In fact, buyers evaluate the value of goods and services and then act on that basis of assessment. After the purchase, whether the buyer is satisfied or not depends greatly on the relationship between the performance of the purchased item and the buyer's expectations. This approach shows that customers are only satisfied with goods and services when they have a positive experience and a good impression of the brand. This is also defined as the level of a person's sensory state derived from comparing results obtained from the product (output) with his/her expectations.

### **E-banking service**

Electronic banking is understood as a banking model that allows customers to remotely access the bank in order to: collect information, carry out financial payment transactions based on the bank's depository accounts, and use new products and services. E-banking is a distribution channel system developed based on using modern information technology to organize the provision of banking products and services (YuSheng & Ibrahim, 2019). In that system, the electronic transactions are carried out through electronic means like: Electronic Fund Transferring at Point of sale (EFTPOS), Automatic Teller Machines (ATMs), Mobile Banking, Internet Banking, and Intranet Banking.

Normally, service businesses often think that service quality comes directly from the level of customer satisfaction. However, many researchers have shown that customer satisfaction and service quality are two distinct concepts but having a close relationship. Service quality is an objective, evaluative and cognitive concept, while satisfaction is a combination of subjective components, mostly based on feelings and emotions (Achimba et al., 2014). Besides, other scholars support the view that customer satisfaction leads to service quality. They believe that service quality is an overall long-term assessment while customer satisfaction is just an evaluation of specific transactions. Other researchers, on the other side, suggest that service quality is a precursor to customer satisfaction. Which view is correct? This, though, has not been confirmed yet because they all have their theoretical basis as well as proven research results (Manon et al., 2017).

In general, the development of e-banking services will help speed up the capital turnover progress of the economy; thereby, speeding up the circulation of goods and currency, and improving the efficiency of capital use. In terms of socio-economic aspects, e-banking contributes to promoting the development of economic, trade, service and tourism activities, facilitating the expansion of economic and trade relations with the region and the world. Especially, it contributes to promoting the development of e-commerce activities. This is when the e-banking system can control most of the money flows, so illegal money transfers can be prevented.

E-banking services also allow the banks to quickly adapt to market changes by adjusting fees, interest rates, and exchange rates to be much more in line with the market conditions. Thereby, the banks can limit the risks of price fluctuations, bringing economic benefits to their stakeholders. This is a remarkable feature compared to traditional banks. In addition, this information network will also provide timely sources of capital for the banks, helping them to have the right and timely policies and execute their plans more quickly and accurately.

The development process of traditional banking services is harmoniously combined with the development of e-banking services, which allows banks and credit institutions to quickly access the state-of-the-art management methods, helping diversify products, increase sales, improve operational efficiency and increase competencies in global integration. The information network helps banks in inspection and supervision activities, which then closely and promptly correct possible violations, and maintain the system safety.

### **Customer satisfaction measurement & Research framework**

Parasuraman et al. (1985) gave 10 factors for determining service quality. By 1988, they had successfully generalized those into 5 factors. The SERVQUAL scale set by Parasuraman and his colleagues in 1988 consists of 2 parts; each has 22 observed variables. The first part defines the customer's expectations for the service in general. That is, regardless of the specific business, the interviewees are to indicate their level of desire for that service. The second part determines the customer's perception of the service performance of the surveyed enterprises. That is to evaluate the perception based on the specific service of the surveyed business. The research results aim to determine the gap between customers' perception of service quality provided by enterprises and customers' expectations for that service quality.

When the SERVQUAL scale was published, there were ongoing debates about how to best measure service quality (Parasuraman et al., 1988). About two decades later, many researchers have worked hard to prove the effectiveness of the SERVQUAL scale. So far, the SERVQUAL service quality measurement model has been considered the most detailed and the most adequate research model for service quality measurement (Figure 1). This is the model that this study has deployed.

Gap 1: occurs when there is a difference between customers' expectations about service quality and the company's perception of customer expectations. This gap is reflected in the company's failure to understand customer expectations.

Gap 2: is that the company or the service provider has difficulty translating its perception of customer expectations into service quality characteristics.

Gap 3 occurs when service provider employees fail to implement predefined service standards. These employees are an integral part of creating service quality for the company/service provider. Therefore, if some employees do not complete the tasks as per set criteria accordingly, it will affect the company's service quality.

Gap 4: occurs due to the non-fulfillment of promises from the company's advertisement/statement of service quality that increases customer expectations but does not keep the promises. This will reduce the perceived quality from the customers.

Gap 5: the difference between customer expectations and reality, or between expected quality and perceived quality. This distance is highly dependent on the previous 4 distances. Thus, to improve service quality, it is necessary to reduce the gap 5 and at the same time narrow the remaining gaps.

Parasuraman and his colleagues have also introduced a 10-component scale for SERVQUAL:

(1) Tangibility is shown through company appearance, service staff's clothing, and service equipment.

(2) Reliability refers to the ability to perform services appropriately, on time, and in the first place.

(3) Responsiveness expresses the desire and willingness of service staff to provide services to customers.

(4) Service capacity refers to the level of expertise to perform the service. This expertise is required for customer service personnel, and the ability to capture relevant information needed for customer service.

(5) Access refers to making it easy for customers to access the service, such as shortening the customer's waiting time, service locations and favorable opening hours for customers.

(6) Kindness expresses customers' warm, respectful and friendly service.

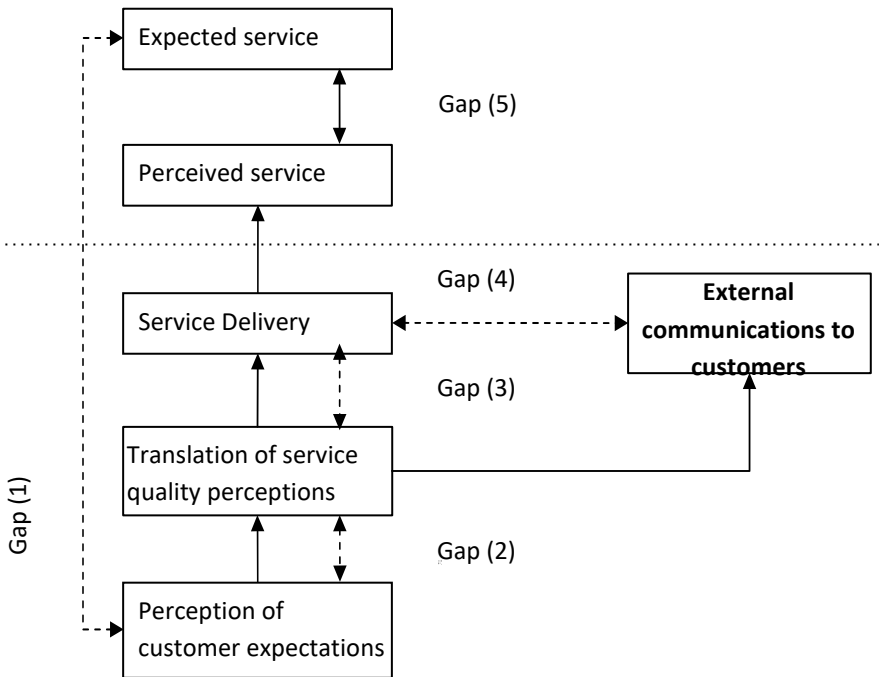
(7) Information relates to communication, conveyed to customers in a language they can easily understand and listen to issues related to them, such as costs, and complaint settlement.

(8) Credibility refers to the ability to create trust for customers, making them better trust the company. This ability is reflected in the company's name and reputation, and the service staff's personality, who directly communicate with customers.

(9) Security refers to the ability to ensure the safety of customers. This is expressed through both physical and financial security, as well as informational security.

(10) Understanding is expressed through the ability to understand customers' needs through knowing their requirements, paying attention to them personally, and identifying regular customers.

Figure 1. Model of 5 service quality gaps



Source: Parasuraman et al. (1988)

This scale covers almost all aspects of the service, but it shows complexity in measurement, whereas it is not reaching discriminatory value in some cases. Therefore, the author has come up with a SERVQUAL scale of 5 components for the research framework development:

1. Assurance: showing professional qualifications, being polite and welcoming service to customers.
2. Tangibles: shown through appearance, dress of service staff, and equipment to perform service.
3. Responsiveness: showing the willingness of service staff to provide timely service to customers.
4. Reliability: showing the ability to perform the service appropriately and on time for the first time.
5. Empathy: showing care for each individual customer.

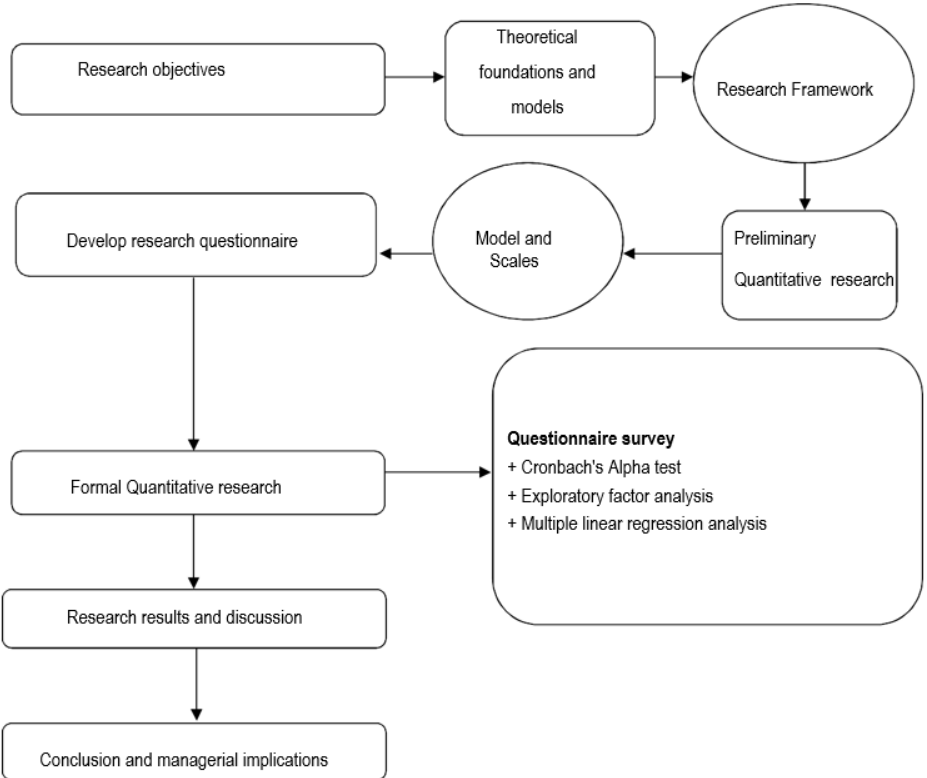
## Methodology

Preliminary quantitative research has been carried out by survey method. Likert scale (1932) (1- Strongly disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly agree) has been used to remove inappropriate variables and to launch a formal questionnaire (Dwivedi



& Nagendra, 2021). Formal quantitative research, then, has been also carried out, using the survey method. The study has utilized the SPSS v.20 software to test the scale by Cronbach's Alpha coefficients. After analyzing the Alpha, the scales will be further tested by exploratory factor analysis to adjust for better fit. In this study, the author chooses a scale with reliability Cronbach's Alpha of greater than 0.6. Correlation coefficient analysis and linear regression are used to test the model's fit. The purpose of the Multiple Linear Regression is to test the linear correlation between the variables in the research model.

Figure 2. Research approach



Source: Author's proposal

The size of the samples, applied in the study, is based on the requirements of exploratory factor analysis and regression. For EFA, due to Hair et al. (2014), the minimum sample size is 5 times the total number of observed variables. In this study, the number of observed variables in the factor analysis is 25, so the expected sample size is  $5 \times 25 = 125$ . For the regression analysis, the minimum sample size to be achieved is calculated by the formula  $n = 50 + 8 \times m$  ( $m$ : number of independent variables in the model) (Tabachnick & Fidell, 1996). In the regression model of the study, the number of independent variables is 14,

so the sample size is  $n = 50 + 8 \times 14 = 162$ . Summarizing 2 conditions on sample size, to ensure reliability and representativeness, As well as the provision of unsatisfactory surveys, the sample size in this study was determined to be 300 (selected safe level at 287). As per the collection of information, the survey sampling technique follows the snowball sampling, which has been done with customers of joint stock commercial banks in the North of Vietnam (meta-case approach). Specifically, in this research the questionnaire has been provided both online and offline for the respondents' convenience while they are asked for help at the bank counters and various possible online groups in which the author is a member. The survey was conducted in the first quarter of 2022 (valid votes collected in the survey were 290).

The multiple linear regression equation is built as follows:

$$Y = \beta_0 + \beta_1 * X_1 + \beta_2 * X_2 + \beta_3 * X_3 + \beta_4 * X_4 + \dots + \beta_n * X_n + e$$

Therein,

Y: Customer Satisfaction on Digital Banking service (Dependent Variable)

$X_1 \rightarrow X_n$ : Observed variables (Independent variable)

$\beta$ : Regression coefficient

e: Residual

In order to realize the main research objective of the topic, the author has determined that this paper needs to answer the following detailed research questions:

*Question 1:* What groups of factors affect the satisfaction of individual customers with the quality of digital banking services in the North of Vietnam?

*Question 2:* How is the impact of these groups of factors on the satisfaction of digital banking services in the North of Vietnam?

*Question 3:* What are the corporate governance implications of studying customer satisfaction with digital banking services in the North of Vietnam?

## Findings and Discussion

### Scale reliability assessment

The scale test allows the author to filter the inappropriate variables, limiting junk variables in the research process and evaluating the scale's reliability by Cronbach's Alpha coefficient. Variables with Corrected Item - Total Correlation coefficient of less than 0.3 will be excluded. Usually, the scales with Cronbach's Alpha coefficients from 0.6 to 0.8 can be used in the case of existence of a new concept under study. Many scholars believe that when the scale has a reliability of 0.8 or more to close to 1.0, it turns out to be a very good scale. Based on these points, the author has had the final measurement results in Table 1.

Table 1. The results of testing the reliability of Cronbach's Alpha scale

| Coding | Observed variables  | Corrected Item – Total Correlation | Cronbach's Alpha if Item Deleted |
|--------|---|------------------------------------|----------------------------------|
| AS1    | Digital bank does exactly what it has promised              | .579                               | .797                             |
| AS2    | Customer information is securely stored                     | .679                               | .767                             |
| AS3    | Digital service is well done within each single transaction | .713                               | .757                             |
| AS4    | It is safe to conduct transactions on the digital space     | .581                               | .796                             |

| Coding  | Observed variables   | Corrected Item – Total Correlation | Cronbach's Alpha if Item Deleted |
|---|--|------------------------------------|----------------------------------|
| <b>Cronbach's Alpha</b> (Assurance Quality) N=4; 1 variable removed       |  | <b>0.821</b>                       |                                  |
| TA1   | The bank has modern equipment and digital facilities to serve its customers                                  | .695                               | .810                             |
| TA2   | It is nice and easy to use the bank's website  | .636                               | .826                             |
| TA3   | There are beautiful and professional online staff image  | .724                               | .801                             |
| TA4   | The bank arranges the working space related to digitization in a scientific and convenient way for customers | .622                               | .835                             |
| <b>Cronbach's Alpha</b> (Tangibles Quality) N=4; 1 variable removed       |  | <b>0.850</b>                       |                                  |
| RE1   | Bank staff provide necessary service information to customers through digital channels                       | .551                               | .719                             |
| RE2   | The fee/interest rate on the digital space is quite competitive  | .726                               | .665                             |
| RE3   | Bank staff serve customers politely and courteously in their digital channels                                | .669                               | .679                             |
| <b>Cronbach's Alpha</b> (Responsiveness Quality) N=3, 2 variables removed |  | <b>0.765</b>                       |                                  |
| RL1   | Bank staff have professional knowledge while serving customers on digital channels                           | .779                               | .858                             |
| RL2   | Digital service channels can segment customers for services without discrimination                           | .794                               | .854                             |
| RL3   | The service attitude of the staff becomes more reliable when contacting customers through digital channels   | .721                               | .871                             |
| RL4   | Bank's online forms and procedures are easy to follow  | .715                               | .872                             |
| <b>Cronbach's Alpha</b> (Reliability Quality) N=4, 1 variable removed     |  | <b>0.891</b>                       |                                  |
| EM1   | The system and service staff both pay due attention to the personalized needs of customers                   | .725                               | .823                             |
| EM2   | Convenient online queuing process  | .767                               | .814                             |
| EM3   | Quick complaint settlement process through digital channels  | .793                               | .804                             |
| EM4   | Convenient timing on supporting transactions through digital channels  | .646                               | .846                             |
| <b>Cronbach's Alpha</b> (Empathy Quality) N=4, 1 variable removed         |  | <b>0.863</b>                       |                                  |

Source: Author's compilation (2022)

### Exploratory Factor Analysis

Factor analysis is the generic name for a group of procedures which are used primarily to reduce and summarize data. In this, variables that do not guarantee reliability will be removed from the scale. The statistical parameters in the EFA analysis are as follows:

- Evaluating the Kaiser – Mayer – Olkin index (KMO) to consider the suitability for an EFA. In the analysis, the KMO index must be greater than 0.5 (Sunho, 2013).
- Bartlett test is used to examine the hypothesis that variables are not correlated

in the population. Bartlett's test must have statistical significance ( $\text{Sig} \leq 0.05$ ), then the observed variables are correlated with each other in the overall population (Hoang & Chu, 2008).

– The method of extracting coefficients is Principal components with eigenvalue of greater than 1, and the total variance extracted is equal to or greater than 50% (Masanori, 2015).

– Factor loading coefficients of less than 0.5 in EFA will continue to be excluded to ensure the convergence between variables. In case the observed variable with factor loading coefficient of greater than 0.5 appears in both factors, if the difference between these two factors is less than 0.3, we need to remove this variable (Watkins, 2018).

EFA has been performed with Principle Component extraction and with Varimax rotation. Having ensured the conditions of exploratory factor analysis ( $\text{KMO} = 0.877$ ;  $\text{Sig.} = 0.000$ ; Total variance extracted = 61,460; Eigenvalue = 1.232), the author has obtained the final factor rotation matrix, as shown in Table 2.

Table 2. Rotated Component Matrix

| Observed Variables | Component |      |      |      |      |
|--------------------|-----------|------|------|------|------|
|                    | 1         | 2    | 3    | 4    | 5    |
| AS1                | .894      |      |      |      |      |
| AS4                | .793      |      |      |      |      |
| AS2                | .679      |      |      |      |      |
| TA2                |           | .658 |      |      |      |
| TA4                |           | .814 |      |      |      |
| TA1                |           | .683 |      |      |      |
| RE1                |           |      | .542 |      |      |
| RE3                |           |      | .591 |      |      |
| RL1                |           |      |      | .716 |      |
| RL3                |           |      |      | .752 |      |
| RL4                |           |      |      | .825 |      |
| EM1                |           |      |      |      | .792 |
| EM2                |           |      |      |      | .768 |
| EM3                |           |      |      |      | .698 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Rotation converged in 6 iterations.

Source: Author's compilation.

In Table 2, we may see that the observed variables AS3, TA3, RE2, RL2 and EM4 respectively are no longer reliable to be used for the purpose of multiple regression for the CSoDB dependent variable. Table 2 is a good suggestion for calculating and providing

regression analysis for the relationship of CSoDB and the remaining 14 observed variables after excluding variables.

### Regression analysis

To evaluate the fit of the regression model to the data set, we use the coefficient  $R^2$ , and the F-test to consider the fit of the overall linear regression model. The t-test is used to reject the hypothesis that the regression coefficients of the population are zero. The degree of influence (strong or weak) between the influencing variables can be seen through the standardized Beta coefficients.

Finally, in order to ensure that the reliability of the eventually constructed regression equation is appropriate, a series of violation detections of the necessary assumption in linear regression has also been performed. The assumptions tested in this section include ones of linear relationship, the variance of the residuals, the normal distribution of the residuals, the independence of the residuals, and the phenomenon of multicollinearity.

Table 3. Summary of regression parameters for the research model

| Model   | R                 | R <sup>2</sup>             | Adjusted R <sup>2</sup> | Durbin-Watson            |        |             |                         |       |
|---|-------------------|----------------------------|-------------------------|--------------------------|--------|-------------|-------------------------|-------|
| 1   | .807 <sup>a</sup> | .651                       | <b>.633</b>             | 1.815                    |        |             |                         |       |
| a. Predictors: (Constant), EM3, AS1, TA4, RE1, EM2, AS4, RL1, RE3, TA2, RL3, AS2, TA1, RL4, EM1 |                   |                            |                         |                          |        |             |                         |       |
| ANOVA <sup>a</sup>  |                   |                            |                         |                          |        |             |                         |       |
| Model   |                   | Sum of Squares             | df                      | Mean Square              | F      | Sig.        |                         |       |
| 1   | Regression        | 115.987                    | 14                      | 8.285                    | 36.680 | <b>.000</b> |                         |       |
|   | Residual Total    | 62.113                     | 275                     | .226                     |        |             |                         |       |
|   | Regression        | 178.099                    | 289                     |                          |        |             |                         |       |
| a. Dependent Variable: CSoDB  |                   |                            |                         |                          |        |             |                         |       |
| Coefficients <sup>a</sup>   |                   |                            |                         |                          |        |             |                         |       |
| Model   |                   | Unstandardized coefficient |                         | Standardized coefficient | t      | Sig.        | Collinearity Statistics |       |
|   |                   | B                          | Std. Error              | Beta                     |        |             | Tolerance               | VIF   |
| 1   | (Constant)        | -.063                      | .158                    |                          | -.397  | .692        |                         |       |
|   | AS1               | .014                       | .044                    | .016                     | .313   | <b>.754</b> | .516                    | 1.937 |
|   | AS2               | .059                       | .041                    | .074                     | 1.447  | <b>.149</b> | .488                    | 2.050 |
|   | AS4               | .093                       | .038                    | .118                     | 2.432  | .016        | .543                    | 1.840 |
|   | TA1               | .027                       | .040                    | .036                     | .675   | <b>.500</b> | .454                    | 2.203 |
|   | TA2               | -.046                      | .040                    | -.059                    | -1.169 | <b>.243</b> | .498                    | 2.006 |
|   | TA4               | .030                       | .028                    | .049                     | 1.095  | <b>.274</b> | .622                    | 1.607 |
|   | RE1               | .003                       | .022                    | .006                     | .152   | <b>.879</b> | .734                    | 1.362 |

|  |     |      |      |      |       |             |      |       |
|--|-----|------|------|------|-------|-------------|------|-------|
|  | RE3 | .045 | .038 | .061 | 1.198 | <b>.232</b> | .490 | 2.040 |
|  | RL1 | .014 | .039 | .018 | .366  | <b>.715</b> | .499 | 2.002 |
|  | RL3 | .088 | .041 | .119 | 2.165 | .031        | .421 | 2.374 |
|  | RL4 | .094 | .042 | .128 | 2.254 | .025        | .393 | 2.544 |
|  | EM1 | .113 | .049 | .142 | 2.294 | .023        | .330 | 3.027 |
|  | EM2 | .130 | .044 | .123 | 2.959 | .003        | .728 | 1.373 |
|  | EM3 | .259 | .046 | .296 | 5.570 | .000        | .448 | 2.231 |

Source: Author's compilation (2022)

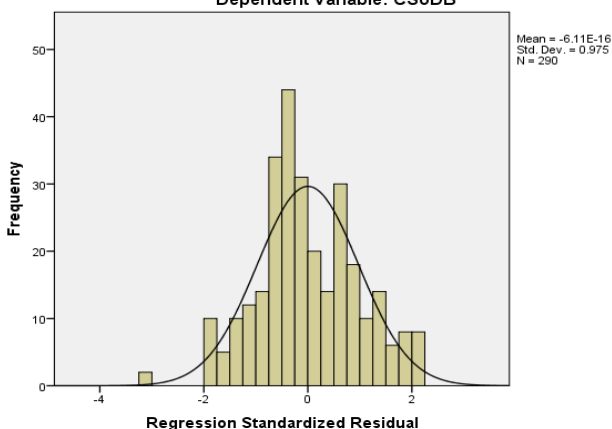
With the parameters of the regression model in Table 3, we can see that the Durbin-Watson value is 1.815. Thus, it is in the range of 1.5 to 2.5, so the regression results do not violate the assumption of first-order autocorrelation (Watkins, 2018). Adjusted  $R^2$  of 0.633 shows that the independent variables included in the regression analysis affect 63.3% of the variation of the dependent variable; the remaining 36.7% are due to out-of-model variables and random errors. However, 08 observed variables have been evaluated as having no impact on the dependent variable due to the Sig value of the t-test (greater than 0.05). The remaining variables all have Sig. of the t-test of less than 0.05, so these variables are all statistically significant, and all affect the dependent variable. The VIF coefficients of the independent variables are all less than 10, and in this case, even less than 3.05. Therefore, the research data does not violate the assumption of multicollinearity.

From the regression coefficients, we can build the normalized regression equation as follows:

$$\mathbf{CSoDB} = 0,118*AS4 + 0,119*RL3 + 0,128*RL4 + 0,142*EM1 + 0,123*EM2 + 0,296*EM3 + e$$

In Figure 3, we can conclude that the Histogram has a symmetrical bell shape with the highest frequencies in the middle and the lower frequencies on the sides, so this is a normal distribution. Moreover, the regression equation also shows the importance of EM3 and EM1 in influencing customer satisfaction with digital banking today. At that time, the quick resolution of customer complaints on the digital banking platform is a priority; Besides, the personalization of online services for customers is also very significant. However, AS4 and RL3, with the lowest influence weights on customer satisfaction should also be considered. The research findings are quite interesting when the safety expectations of online users are not highly appreciated, nor does the service attitude of the employees towards customers. This paves the ways for new research directions to understand customers' views on financial services in the digital space, especially with digital banking.

Figure 3. CSoDB histogram of standardized distribution  
Dependent Variable: CSoDB



Source: Author's compilation

## Conclusion

Based on the findings, a surprising fact is that the factors belonging to two groups of Tangibles Quality and Responsiveness Quality are not among the affecting factors on customer satisfaction with the quality of digital banking services in Vietnamese context. This can be simply explained, especially for the tangible elements, when the service space which is being performed in is intangible, while the customers' expectations are being placed on the aspects that they cannot perceive with their ordinary senses. In addition, the service aspects such as complete information, low fees and interest rates provision, or even the courtesy in responding to customer requests might not be the key points for customer satisfaction herein. Meanwhile, the groups of Assurance Quality, Reliability Quality, and Empathy Quality are, ascendingly, the factors that influence customer satisfaction. We can also see that when customers have an overall belief in the safety of transactions on digital platforms, all other technical factors no longer cause concern for them. At that time, the needs to be met are procedures, processes, and sample forms that must be done easily and quickly, with a transparent and convenient queuing process. Accordingly, for the bank staff, the process of providing services through digital platforms should be conducted with a thoughtful and dedicated service attitude, with special attention to personalized needs of their customers with the aids of modern information technology. The highest level of customer satisfaction is obtained when the intelligent digital system can make it shorter to resolve their complaints, faster than ever. This is also the dilemma that traditional systems often have to face.

Thus, the implications for the corporate governance process of commercial banks in the North of Vietnam when observing digital customer satisfaction are concentrated on the following three main aspects: (1) banks need to improve the complaint settlement process with smarter algorithms, while fully understanding transaction history of customers and being able to analyze customer needs in real-time with an artificial intelligence application system; (2) employee training should be the main focus, especially for the skills and tactics to serve customers in a high-class digitalized banking environment; importantly, the results of

traditional training should not be imposed on this; (3) investment in customer's online experience should be increased so that the forms, service process and instructions become extremely user-friendly, in parallel with the establishment of a secure transacting platform. Digital banking services only have absolute safety when the banks have the collaboration with the world's leading security firms in the banking sector. Compared with various previous studies on customer satisfaction, this study has shown that the satisfaction in the digital space for e-services of banks. It certainly, has many distinct characteristics. In which the focus of corporate governance is placed on the necessary content with digital satisfaction in transactions, while not being affected by the traditional contents of the familiar theoretical model. In particular, the research is conducted in the context of commercial banks in the North of Vietnam, with unique characteristics of consumer culture, digital banking products, and level of technology development. These are the things that the other studies have not mentioned yet.

Although this study has achieved the predetermined goal of assessing the main factors affecting customer satisfaction and the degree of influence of these factors on customer satisfaction while and after experiencing the service. Digital banking model in national finance-banking system, in which respondents are working for in the North of Vietnam, has prospered recently. However, the study also has some certain limitations. Firstly, it was only conducted with relatively small sample size, and it merely concentrated in the country's northern region with specific customer groups in terms of culture and consumption behavior of banking products. Then, it is not yet highly generalizable for the whole country of Vietnam. Second, digital banking is still an incomplete destination for the core banking system in many joint stock commercial banks in the financial system, so assessing customer satisfaction in this field also needs to be evaluated, added and fulfilled. Third, in addition to clarifying the factors affecting digital satisfaction, the research does not have enough time and resources to approach and analyze digital loyalty for fintech products in Vietnam. These temporary constraints has in their turns opened up new research directions for near future researches.

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