


**TECHNOLOGY AFFECTING THE SERVICE QUALITY OF COMMERCIAL BANKS IN VIETNAM**

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p><b>Received</b> 27 January 2023</p> <p><b>Accepted</b> 22 March 2023</p>	<p><b>Purpose:</b> The study studies the factors affecting the quality of banking services of commercial banks, commercial bank branches operating in Vietnam. The authors proposed policy implications based on research results that improve the quality of commercial banking services.</p> <p><b>Theoretical framework:</b> Service quality measurement is difficult because of its characteristics: intangibility, heterogeneity, and inseparability. The concept of service quality has been researched and developed in many recent decades through customer satisfaction.</p> <p><b>Design/methodology/approach:</b> The authors conducted quantitative research in 2 phases. Phase 1 is a preliminary quantitative study: collecting data to check the reliability of the scales in the research model and completed in October 2022. Phase 2 is the official quantitative research: collecting data on a large scale after building and perfecting the appropriate scales, to be carried out from November to February 2023. Processing data by statistical methods, analyzing EFA and CFA, using the structural equation model analysis (SEM) method to test the fit of models and hypotheses with SPSS 20.0 software and Amos.</p> <p><b>Findings:</b> The article’s findings showed that technology factors affect commercial banks’ service quality in Vietnam. At the same time, it introduces some changes in Vietnamese banks in the context of current technological breakthroughs.</p> <p><b>Research, Practical &amp; Social implications:</b> Practical implications enhanced the service quality of commercial banks in the context of digital technology breakthroughs. The amount of information that can be encoded and the tools were available to process it has increased dramatically.</p> <p><b>Originality/value:</b> The paper’s originality and value help bank managers invest in digital technology as the way forward to better serve their customers. Besides, the article has systematized the theory of service quality and factors affecting the quality of commercial banking services.</p>
<p><b>Keywords:</b></p> <p>Digital; Transformation; Finance; Technology; Developing; Service Quality; Commercial Banks; Vietnam.</p> <div data-bbox="172 1093 480 1339" style="text-align: center;">  </div>	<p>Doi: <a href="https://doi.org/10.26668/businessreview/2023.v8i4.1757">https://doi.org/10.26668/businessreview/2023.v8i4.1757</a></p>

**TECNOLOGIA QUE AFETA A QUALIDADE DO SERVIÇO DOS BANCOS COMERCIAIS NO VIETNAME**

**RESUMO**

**Objetivo:** O estudo estuda os fatores que afetam a qualidade dos serviços bancários dos bancos comerciais, agências de bancos comerciais que operam no Vietnã. Os autores propuseram implicações políticas baseadas em resultados de pesquisa que melhoram a qualidade dos serviços bancários comerciais.

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**Estrutura teórica:** A medição da qualidade dos serviços é difícil devido a suas características: intangibilidade, heterogeneidade e inseparabilidade. O conceito de qualidade de serviço tem sido pesquisado e desenvolvido em muitas décadas recentes através da satisfação do cliente.

**Design/metodologia/abordagem:** Os autores conduziram pesquisas quantitativas em 2 fases. A fase 1 é um estudo quantitativo preliminar: coleta de dados para verificar a confiabilidade das escalas no modelo de pesquisa e concluída em outubro de 2022. A fase 2 é a pesquisa quantitativa oficial: coleta de dados em grande escala após a construção e aperfeiçoamento das escalas apropriadas, a ser realizada de novembro a fevereiro de 2023. Processamento de dados por métodos estatísticos, analisando EFA e CFA, usando o método de análise do modelo de equação estrutural (SEM) para testar a adequação dos modelos e hipóteses com o software SPSS 20.0 e Amos.

**Descobertas:** As descobertas do artigo mostraram que os fatores tecnológicos afetam a qualidade do serviço dos bancos comerciais no Vietnã. Ao mesmo tempo, ele introduz algumas mudanças nos bancos vietnamitas no contexto dos avanços tecnológicos atuais.

**Pesquisa, implicações práticas e sociais:** As implicações práticas melhoraram a qualidade do serviço dos bancos comerciais no contexto dos avanços tecnológicos digitais. A quantidade de informação que pode ser codificada e as ferramentas disponíveis para processá-la aumentou drasticamente.

**Originalidade/valor:** A originalidade e o valor do papel ajudam os administradores dos bancos a investir na tecnologia digital como o caminho para melhor servir seus clientes. Além disso, o artigo sistematizou a teoria da qualidade do serviço e os fatores que afetam a qualidade dos serviços bancários comerciais.

**Palavras-chave:** Digital, Transformação, Finanças, Tecnologia, Desenvolvimento, Qualidade de Serviço, Bancos Comerciais, Vietnã.

## LA TECNOLOGÍA AFECTA A LA CALIDAD DEL SERVICIO DE LOS BANCOS COMERCIALES DE VIETNAM

### RESUMEN

**Propósito:** El estudio estudia los factores que afectan a la calidad de los servicios bancarios de los bancos comerciales, sucursales de bancos comerciales que operan en Vietnam. Los autores proponen implicaciones políticas basadas en los resultados de la investigación que mejoran la calidad de los servicios bancarios comerciales.

**Marco teórico:** La medición de la calidad de los servicios es difícil debido a sus características: intangibilidad, heterogeneidad e inseparabilidad. El concepto de calidad de servicio se ha investigado y desarrollado en muchas décadas recientes a través de la satisfacción del cliente.

**Diseño/metodología/enfoque:** Los autores realizaron una investigación cuantitativa en 2 fases. La fase 1 es un estudio cuantitativo preliminar: recogida de datos para comprobar la fiabilidad de las escalas del modelo de investigación y finalizado en octubre de 2022. La fase 2 es la investigación cuantitativa oficial: recogida de datos a gran escala tras construir y perfeccionar las escalas adecuadas, que se llevará a cabo de noviembre a febrero de 2023. Procesamiento de datos por métodos estadísticos, analizando EFA y CFA, utilizando el método de análisis de modelos de ecuaciones estructurales (SEM) para probar el ajuste de los modelos y las hipótesis con el software SPSS 20.0 y Amos.

**Conclusiones:** Las conclusiones del artículo muestran que los factores tecnológicos afectan a la calidad del servicio de los bancos comerciales en Vietnam. Al mismo tiempo, introduce algunos cambios en los bancos vietnamitas en el contexto de los avances tecnológicos actuales.

**Investigación, implicaciones prácticas y sociales:** Las implicaciones prácticas mejoran la calidad de servicio de los bancos comerciales en el contexto de los avances tecnológicos digitales. La cantidad de información que puede codificarse y las herramientas disponibles para procesarla han aumentado espectacularmente.

**Originalidad/valor:** La originalidad y el valor del artículo ayudan a los gestores bancarios a invertir en tecnología digital como vía para servir mejor a sus clientes. Además, el artículo ha sistematizado la teoría de la calidad del servicio y los factores que afectan a la calidad de los servicios de la banca comercial.

**Palabras clave:** Digital, Transformación, Finanzas, Tecnología, Desarrollo, Calidad de Servicio, Bancos Comerciales, Vietnam.

## INTRODUCTION

Monetary policy aims to stabilize the macro-economy, curbing inflation and ensuring the country's social security. The financial intermediaries system, in general, and commercial banks, in particular, play a vital role in the market economy, acting as a bridge between the economic actors, making the subjects stick together and depend on them. Each other increases the coherence and dynamism of the whole system. Commercial banks have become an indispensable financial institution to operate the economy. The state-owned commercial banking system is also considered an effective arm of the government in implementing policy.

Besides, the quality of banking services plays a significant role. It was the banking operations regarding capital, currency, payment, etc. Similarly, the bank provides customers a way to meet business needs, make a profit, live life, and store assets. The bank collects the difference in interest rates, exchange rates, or charges through the service. In the current trend of banking development in developed economies, commercial banks are considered service supermarkets and financial department stores with hundreds or even thousands of different services depending on how they are classified and the level of development of the bank. However, in Vietnam, there are some diverse views on banking services.

Achmad & Burhanuddin (2020) said that the profitable activities of commercial banks besides lending activities are called service activities. This view separates credit activities, a traditional and mainly recent activity of Vietnamese commercial banks, from service activities, a new activity that has just begun to develop in Vietnam. Such delineation in the current trend of integration and opening of the financial services market allows the bank to focus on diversifying, developing, and improving the efficiency of non-credit activities. The existence and development of commercial banks and any business depend significantly on customers because customers are product consumers and decide on sales based on their satisfaction with the product. When customers are satisfied, the ability to continue choosing products/services and making purchases is high, so commercial banks always consider customers as gods, taking customers as the center to develop and supply new products/services. Products/services that best meet the needs and tastes of customers.

Policies to improve the quality of commercial banking services in Vietnam. The above problems show that improving service quality is something that every bank wants, but doing it smoothly is a problem. For commercial banks in Vietnam, that task seems even more difficult. Stemming from this fact, studying factors affecting the quality of banking services of commercial banks in Vietnam will have high practical significance and serve as a scientific

basis for the main implications. With the above analysis problems, the authors chose “Technology affecting the service quality of commercial banks in Vietnam” as a paper for researching in finance - banking.

Based on the current situation of digital technology in the banking industry in Vietnam and a review of previous studies, the article proposes future research directions on the influence of digital banking technology on the macro areas of the economy, customer behavior based on big data, and the impact of banking digitization on business and bank operations. The study has theoretical and practical contributions.

## **THEORETICAL FRAMEWORK**

### **Theories of the Commercial Banking Service Quality (CBS)**

Landier & Thesmar (2020) studied the history of bank establishment and development accounts for commodities production development. The economic process of growth is a condition that requires the development of banks, and the banking system’s product becomes a driving force for economic development. Banking began with the exchange or minting of goldsmiths and loan sharks. Each country circulates its currency to serve the exchange of goods and international businesses. There has been a requirement to mint and exchange money at border gates or trade centers.

Regarding the circulation of metal coins (silver or gold), the owners of gold and silver shops exchange money, make payments, and mint coins. Some loan sharks also perform money exchange, holding, and payment services. Besides, these activities formed the earliest banking operations. Banks are an essential type of organization for the economy. Banks have their function, services, or role in the economy. We can, however, consider some banking concepts (Szopiński, 2016; Yaseen & El, 2018; Shanka, 2020).

Panjaitan (2020) showed that service is an economic sector in which production activities do not bring tangible physical products but bring benefits with monetary value. Economically, production and consumption coincide and cannot be stored. Services are also behaviors, processes, and ways of doing a particular job to create use-value for customers to satisfy their needs and expectations of the customer (Tesfaye, 2020; Siu & Devesh, 2019).

Pakurar & Haddad (2019) showed that banking services are banking operations in the capital, currency, payment, etc. Banks provide to customers to meet business needs, generate profits, live life, and store assets. And the bank collects the difference in interest rates, exchange rates, or charges through that service. Depending on the classification and the bank’s growth

level, regarded as a service supermarket, a financial department store with hundreds or even thousands of different services.

The concept of banking service quality: Product quality is a complex category that depends on many factors. Quality is also an object of research in fields such as production, technology, and marketing and is also a concern of manufacturers, designers, especially consumers, who desire to satisfy consumer needs to use more and more (Szopiński, 2016; Yaseen & El, 2018; Shanka, 2020).

### **Factors Affecting the Quality of Banking Services**

**Reliability:** According to Zureikat (2017), reliability represents the ability to fulfill what customers expect from banking services through bank communications. Specifically: (1) Is the service performed at the predetermined time. (2) The bank has enthusiastic support when customers have problems. (3) Does the bank perform the service precisely as committed at the first time with the customer. Does the bank check to avoid errors in performing services for customers.

According to Ngu et al. (2019), commercial banks are reputable, have great market value, fulfill their commitments to customers, and make them feel secure when transacting with the bank goods or not.

According to Murari (2020), commercial banks have a high degree of credibility and always do what commercial banks have committed, no matter what. Customers' complaints are paid attention to and satisfactorily resolved by commercial banks, customers' information is kept confidential, etc., increasing the quality of banking services. Based on the above analysis, the authors propose hypotheses H1 as follows:

*H1: Reliability (Rel) positively impacts the service quality of commercial banks in Vietnam.*

**Empathy:** According to Moyo (2018) showed that empathy is the care and service for each customer. In addition, client managers care not only for themselves but also for their families. Currently, many commercial banks have launched services that bring many conveniences to customers. What is more critical and deeper is to fulfill the wishes of many different customers. Therefore, banks are very interested in this issue to create trust in customers and potential customers.

Mobin (2017) showed that empathy is considerate customer care. It gave customers the best possible thoughtful treatment to help them feel they were high-class bank customers and

were always warmly welcomed. The human factor is at the core of this success, and the more the bank cares about its customers, the more sympathy will be. Based on the above analysis, the authors propose hypothesis H2 as follows:

*H2: Empathy (Emp) positively impacts the service quality of commercial banks in Vietnam.*

**Responsiveness:** According to Ioannou (2020) showed that the level of responsiveness indicates whether the bank can react quickly and flexibly when needed. The bank can estimate and give a specific time to perform an unusual activity for the customer, such as fixing a problem or providing a periodical warranty. Can that operation be done quickly, saving time for customers when going to the bank for a transaction?

Kant & Jaiswal (2020) showed that responsiveness is a criterion to measure the ability to solve problems quickly, effectively handle complaints, be ready to help customers, and respond to requests. Responsiveness is the desire and willingness of employees to provide timely service to customers. In other words, responsiveness is the response from the service provider to what the customer wants. Based on the above analysis, the authors propose hypothesis H3 as follows:

*H3: Responsiveness (Res) positively impacts the service quality of commercial banks in Vietnam.*

**Competence:** According to Mackay & Major (2017), service capacity represents customer trust and trust. This factor is felt through professional service, sound professional knowledge, style, courtesy, and good communication skills to feel secure when using the bank's services. Service capacity is demonstrated through the professional qualifications of the staff to perform the service. Muslim & Zaidi (2018) showed that service capacity is the factor that creates credibility and trust for customers, which has professional service, sound professional knowledge, polite demeanor, and ability. Good communication so that customers feel secure when using the bank's services. Service capacity is expressed through professional qualifications to perform services. Based on the above analysis, the authors propose hypothesis H4 as follows:

*H4: Competence (Com) positively impacts the service quality of commercial banks in Vietnam.*

**Tangibles:** According to Hilda (2018), banking technology has a decisive influence on service expansion, quality improvement, and customer service delivery methods. Moreover, the ability to manage a bank in business depends a lot on the technology level of the bank.



Therefore, banks taking shortcuts to catch up with modern banking technologies will have opportunities to develop banking services.

Hari & Bhavani (2015) showed that tangible means are the facilities' external image, the staff's attitude, documents, manuals, and banking communication systems. In general, everything that the customer can see directly with the eyes and senses can affect this factor (Anto & Yusran, 2023). Based on the above analysis, the authors propose hypothesis H5 as follows:

*H5: Tangibles (Tan) positively impact the service quality of commercial banks in Vietnam.*

**Crisis:** According to Alamgir & Shamsuddoha (2020) showed that research shows that the Covid-19 pandemic has had a multi-faceted impact on the bank's operations, specifically: deposit interest rates fell after two reductions in operating interest rates. While interest rates fell, banks also reduced lending, leading to a flat or slight decrease in many banks' net interest income/interest-earning assets; fee income and wrong debt recovery decelerated; Net profit declines at banks with high corporate lending ratio. The crisis factor also has other objective causes that affect the quality of banking services such as banking services. Diseases, natural disasters. Currently, the Covid-19 epidemic is very complicated. The effect of Covid-19 on banking activities has been disclosed. This factor can be recorded until now, before the epidemic's progress, and the level of impact was regarded as severe, complicated, and unpredictable. This point in several aspects: Daily operational activities, credit balance growth; profit; and bad debt. Each element affected by the Covid-19 pandemic presents opportunities and challenges. With the problems analyzed above, the authors propose the research hypotheses H6 as follows:

*H6: Crisis (Cri) positively impacts the banking services of commercial banks in Vietnam.*

**Technology:** Technological factors: Each industrial revolution has its characteristics in each stage. The essence of the 4th industrial revolution is based on digital technology and integrates all intelligent technologies to optimize production processes and methods with technologies. With the advantage of technology, the industrial revolution 4.0 has profoundly impacted the economies and societies of countries worldwide, including Vietnam's banking industry. Baker et al. (2020) showed that the technology factor indicates that the industrial revolution 4.0 has been happening fast, affecting all aspects of the world, including Vietnam. Banking is one of the fields considered to be most strongly influenced by the industrial

revolution 4.0. Still, this new wave of technology is creating apparent changes in the financial - banking sector. Significantly changing distribution channels and traditional banking products and services (Penpokai et al., 2023). With the above analysis problems, the authors proposed the research hypotheses H7 as follows:

*H7: Technology (Tec) positively impacts the banking services of commercial banks in Vietnam.*

**Management capacity:** According to Cheserek et al. (2015), the management capacity of the management board of commercial banks is one factor that significantly influences the development of commercial banking services. When the management of a commercial bank has a good vision and business administration capacity, it will help promote the development of banking services. Governance capacity is significant in the banking sector. If banks want to catch up with the industrial revolution 4.0, they must change how they operate by applying banking management software (Amin, 2016). Banks need to create added value through quality, efficiency, and process. With the above analysis problems, the authors propose the research hypotheses H8 as follows:

*H8: Management capacity (Man) positively impacts the banking services of commercial banks in Vietnam.*

## RESEARCH METHODS

**Qualitative research methods:** Qualitative research includes a paper of references and desk research to review research and find new concepts, tests, and independent screen variables in evaluating the quality of banking services for customers. The authors check the scale's validity and in-depth interviews with relevant subjects. Specifically, the authors have consulted with 30 managers in the banking sector who are heads of the customer service department, deputy directors, and directors of branches of commercial banks in 5 big cities, including Can Tho, Ho Chi Minh, Da Nang, Hai Phong, and Hanoi. Based on the opinions of 30 knowledgeable managers in the banking sector, the authors determined what information needed to be collected from experts' views and formed a survey. The goal is to point out some new aspects in the range of prepared questions.

**Quantitative research methods:** The authors conducted quantitative research in 2 phases. Phase 1 is a preliminary quantitative study: collecting data to check the reliability of the scales in the research model and completed in October 2022. Phase 2 is the official quantitative research: collecting data on a large scale after building and perfecting the



appropriate scales, to be carried out from November to February 2023. Processing data by statistical methods, analyzing EFA, and CFA, using the structural equation model analysis (SEM) method to test the fit of models and hypotheses with SPSS 20.0 software and Amos.

The paper uses the research and development process of the scale in steps:

Step 1: The authors determine the conceptual content based on the theory.

In step 1, the research conducted three contents: (1) theoretical overview to study related concepts such as quality, service, and banking services. Factors affecting the quality of banking services; (2) Determine the relationship between the ideas of the research model; (3) Build an initial scale for research concepts that already have a scale, namely a scale with factors affecting the quality of banking services.

Step 2: The authors build variables to measure concepts through empirical research and group discussion of 30 managers related to the banking sector.

In this step, there are two specific tasks as follows: (1) Adjust and supplement the scale of concepts that already have a scale; (2) Build a set of variables of the scale of new concepts included in the model, namely the scale of the crisis, technology and governance capacity.

The preliminary research intends to adjust and supplement the original scales through focus group discussions. Focus group interviews for some groups were established and conducted interviews (group of deputy heads of customer departments and deputy heads of branches). As a result of this step, the original scale is adjusted and is called the revised scale.

Step 3: Collect data

The authors conduct preliminary quantitative research using the questionnaire built at the end of step 2, sent to each customer. The sample size to be collected is  $n = 500$  customers using commercial bank branches' services in five big cities: Can Tho City, Ho Chi Minh City, Da Nang, Hai Phong, and Hanoi participated in the interview.

Step 4: Preliminary scale assessment by Cronbach's alpha reliability coefficient and EFA analysis on the data collected in step 3.

Step 5: Continue to collect data

In this step, the authors conduct formal research in 5 big cities: Can Tho City, Ho Chi Minh City, Da Nang, Hai Phong, and Hanoi. Here are five Cities representing the whole country for data collection. The object of investigation to collect data is customers using services of commercial banks' branches in the areas mentioned above. For each city, the authors surveyed 200 customers. The information collection method is a prepared questionnaire sent to each customer, and the sample size is  $n = 1,000$  customers. The authors had a probabilistic charge

sampling method, a random sampling technique for evaluation. After the authors collected the data, it had coding, data entry, cleaning, and data analysis with SPSS version 20.0 software, Amos software (Hair et al., 2021).

Step 6: Evaluate the scale's reliability by Cronbach's alpha based on the data collected in step 5. Cronbach's alpha had on data collected in official research. In this step, the authors re-test the reliability of the rankings through the evaluation of the coefficients.

Step 7: The authors evaluate the scale value using EFA and CFA analysis in the SEM model.

Confirmatory factor analysis method. EFA analysis based on the scale evaluated for reliability through Cronbach's alpha coefficient performed in step 6 and data collected in the formal study in step 5. The criterion (CFA) tests the validity of the scales. As shown, the authors combined EFA and CFA analysis in the SEM model used to replace step 7 in the procedure proposed (Hair et al., 2021).

Step 8: The authors determine the standard scale and analyze the SEM structure to test the model and research hypotheses. The SEM structural analysis method had to try the suitability of the theoretical model and the research hypotheses built (Hair et al., 2021).

Step 9: Based on model testing results, the authors propose policy implications.

In summary, in the paper, the author's research synthesizes theoretical bases and related studies at home and abroad, building a research model. After having the research model, the authors form the expected scale, check the model and the scale, and collect preliminary data for preliminary assessment of the reliability and value of the scale. After initial completion, the authors collect official data to test the research model and hypotheses. Finally, the authors make conclusions and suggest policy implications that improve the quality of commercial banking services.

The detailed content of the research process includes two research methods. The paper uses qualitative and quantitative research in the section mentioned above.

## **EMPIRICAL RESULT**

### **Overview of Commercial Banks in Vietnam**

According to data from the State Bank of Vietnam's annual report in 2022, shown below, from 2021 to 2022:

Commercial banks are still trying to improve their financial capacity, especially commercial banks, whose asset growth has been stable over the years. Results show that the

total assets of the retail banking sector in recent years have always had reasonably steady growth. The total assets of commercial banks in 2021 reached VND 5,212,516 billion, nearly equal to the support of state-owned commercial banks. Although the asset value is much lower than domestic, commercial banks, joint venture banks, and foreign banks have the highest growth, increasing by 18-19%.

Besides, the ratio between equity capital to total assets of Vietnamese commercial banks data shows two different extremes, a group of banks has two proportions of equity to high total assets, and there is a group of banks with these two low coefficients. Groups of banks with high coefficients, such as joint ventures and foreign banks, are not necessarily good in profit. Moreover, it is possible that these banks do not have to maintain such a high ratio actively but may have difficulty raising capital or have liquidity problems. In addition, commercial banks' minimum capital adequacy ratio for 2021-2022. The results show that the Vietnamese commercial bank system's minimum capital adequacy ratio (CAR) remains relatively stable across banking groups and is above 9%. The following are the results of two ROA and ROE ratios of commercial banks over the three years 2021-2022 as follows:

The ROA and ROE of the whole system were 1.01% and 12.95%, respectively, an increase compared to 2021, which was 0.9% and 11.8%, respectively.

Data analysis from Vietnamese commercial banks' financial statements show that by 2020, Vietnam's banking industry: Challenges by the crisis caused by the Covid-19 pandemic. The results show that the growth rate has tended to slow down and decrease continuously in recent years. In 2021, customer deposit growth at commercial banks reached 11.8%, the highest in 2021-2021. In the context of economic difficulties due to the impact of the Covid-19 pandemic, creating challenges for the commercial banking industry.

Results show the credit growth trend of Vietnamese commercial banks in 2021-2022. In 2021, the credit balance of the entire economy was only about VND 7,211,175 billion, up 9.16 percent compared to 2020, the credit balance reached VND 8,195,393 billion in 2019, an increase of 11.34 percent same percentage in 2022, and credit growth was 14.56 percent. Large commercial banks in big banks still account for over 70% of the lending market. Domestic commercial banks' branches, joint-venture banks, and foreign branches account for only 30%. Status of payment services at commercial banks: From 2021-2022, commercial banks have recorded extraordinary impressions of the individual customer segment, such as focusing on investment, perfecting and improving product quality, and a series of new products and services. Business promotion activities had to create the strong development of commercial

banks. The interbank electronic payment system operated safely, efficiently, and smoothly. Infrastructure and technology for non-cash payments, especially electronic payments, focus on investment, quality improvement, and better response to society's growing payment needs. And adapt to the process of international economic integration.

In general, the Covid-19 pandemic has harmed the world economy, particularly in Vietnam. The Vietnamese banking system and commercial banks must actively implement and deploy many policies to support customers in overcoming difficulties together. However, in the implementation process, commercial banks also face many challenges. Therefore, in this situation, commercial banks need to analyze and assess the challenges and opportunities to have timely response plans to minimize risks in the years after the Covid-19 pandemic. With the orientation to build and develop to become the leading banks in terms of service quality, find the right direction to improve competitiveness and affirm the position and brand of commercial banks.

Vietnam is facing remarkable opportunities in digital transformation, with more than 50% of the population owning more than 130 million mobile subscribers under the age of 35 accounts for more than 50%, Internet subscribers are about 67%, the average smartphone usage time of Vietnamese is 2 hours/day; the e-commerce growth rate is 30%/year. Thus, the digital technology development in Vietnam still has a significant gap in the development of banks in Vietnam and the world. This is the factor that shows the potential in research on digital banking technology in Vietnam as well as the ability to find new and unique research results when learning about banking digital technology

### **Analysis of Regression Coefficients in the SEM Model**

In the paper, the authors use descriptive statistics to describe the essential characteristics of the data collected from the survey results of 1,000 customers using the services of commercial banks in 5 big cities in Vietnam. Descriptive statistics demonstrate the use of graphs that describe data. To understand the phenomena and make the right decisions, the basic methods of data description are frequency tables, mortality rates, cumulative frequencies, and cumulative frequencies. In addition, the paper also uses descriptive statistics of mean, standard deviation, variance, and standard error by Hoang Trong et al. (2008).

According to individual customer characteristics, descriptive statistics describe the essential features of the data collected from the study. Sample structure by gender.

Cronbach's Alpha is 0.5. Many studies think a suitable scale, ranging from 0.7 to close to 0.8, may be used when Cronbach's Alpha coefficient is between 0.8 and 1. Others believe that Cronbach's Alpha of 0.6 or more, if the concept is measured, is new or new to the respondents in the research context and the minimum of the coefficients.

Table 1: Descriptive statistics on demographics

Gender	Customers	Percent	Valid percent	Cumulative percent
Male	412	44.9	44.9	44.9
Female	505	55.1	55.1	100.0
Total	917	100.0	100.0	
Income	Customers	Percent	Valid percent	Cumulative percent
Single	386	42.1	42.1	42.1
Married	531	57.9	57.9	100.0
Total	917	100.0	100.0	
Age	Customers	Percent	Valid percent	Cumulative percent
From 18 to under 25 years old	72	7.9	7.9	7.9
From 25 to under 35 years old	221	24.1	24.1	32.0
From 35 to under 45 years old	480	52.3	52.3	84.3
From 45 to 55 years old	101	11.0	11.0	95.3
Over 55 years old	43	4.7	4.7	100.0
Total	917	100.0	100.0	

Source: Prepared by the authors (2022)

Table 1 shows 412 male customers account for 44.9% and 55.1%, respectively. The rest are female, with 917 valid votes.

Table 2: Cronbach's Alpha of factors

Code	Factors	Cronbach's Alpha
Rel	Reliability	0.966
Emp	Empathy	0.883
Res	Responsiveness	0.963
Com	Competence	0.956
Tan	Tangibles	0.860
Cri	Crisis	0.952
Tec	Technology	0.921
Man	Management capacity	0.961
CBS	Commercial bank service quality	0.954

Source: Prepared by the authors (2022)

Cronbach's Alpha is 0.5. Table 2 shows that many studies think a suitable scale, ranging from 0.7 to close to 0.8, may be used when Cronbach's Alpha coefficient is between 0.8 and 1. Others believe that Cronbach's Alpha of 0.6 or more, if the concept measured, is new or new to the respondents in the research context and the minimum of the coefficients. In the paper, the authors use descriptive statistics to describe the essential characteristics of the data collected from the survey results of 1,000 customers using the services of commercial banks in 5 big

cities in Vietnam. Descriptive statistics demonstrate the use of graphs that describe data. To understand the phenomena and make the right decisions, the basic methods of data description are frequency tables, mortality rates, cumulative frequencies, and cumulative frequencies. In addition, the paper also uses descriptive statistics of mean, standard deviation, variance, and standard error (Hair et al., 2021).

Table 3: Sample descriptive statistics about dependent factors

<b>Code</b>	<b>Customers</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Res1	917	1.00	5.00	3.0720	0.99521
Res2	917	1.00	5.00	3.0807	1.00002
Res3	917	1.00	5.00	3.1091	0.97069
Res4	917	1.00	5.00	3.0687	1.01122
Tan1	917	1.00	5.00	3.3882	0.88275
Tan2	917	1.00	5.00	3.5136	0.97517
Tan3	917	1.00	5.00	3.3272	0.99005
Tan4	917	1.00	5.00	3.3904	0.91699
Com1	917	1.00	5.00	3.0436	0.97471
Com2	917	1.00	5.00	3.0643	0.98416
Com3	917	1.00	5.00	3.0949	0.94658
Com4	917	1.00	5.00	3.0731	0.97910
Rel1	917	1.00	5.00	3.0698	0.97878
Rel2	917	1.00	5.00	3.0556	1.00227
Rel3	917	1.00	5.00	3.0971	0.96351
Rel4	917	1.00	5.00	3.0949	0.97722
Man1	917	1.00	5.00	3.0720	0.99631
Man2	917	1.00	5.00	3.0763	1.00580
Man3	917	1.00	5.00	3.1069	0.97206
Man4	917	1.00	5.00	3.0851	1.00943
Emp1	917	1.00	5.00	2.3555	0.65092
Emp2	917	1.00	5.00	2.4406	0.66577
Emp3	917	1.00	5.00	2.3959	0.64688
Emp4	917	1.00	5.00	2.4667	0.70883
Tec1	917	1.00	5.00	2.3588	0.65331
Tec2	917	1.00	5.00	2.4275	0.67263
Tec3	917	1.00	4.00	2.3915	0.64447
Tec4	917	1.00	5.00	2.4406	0.69935
Tec5	917	1.00	5.00	2.4504	0.70941
Cri1	917	1.00	5.00	3.4002	0.94506
Cri2	917	1.00	5.00	3.3381	0.95602
Cri3	917	1.00	5.00	3.2824	0.99224

Source: Prepared by the authors (2022)

Table 3 shows that the number of customers with the lowest answer is 1.0, and the highest is 5.0. The mean between the variables is around 3.0 and is less than 1.0.



Table 4: CFA test results for all scales

Indicators	Value	Standard	Result
CMIN/DF	4.807	< 5.0	Good
GFI	0.857	> 0.8	Good
TLI	0.926	> 0.9	Good
CFI	0.936	> 0.9	Good
RMSEA	0.064	< 0,08	Good
Sig value	0,00	< 0,05	Good

Source: Prepared by the authors (2022)

Table 4 shows the model goodness of fit indicators such as chi-square, chi-squared adjusted for degrees of freedom (CMIN/df), CFI comparability index, TLI index, and the index. A model is considered appropriate when the chi-squared test has a p-value less than < 0.05. Thus, the above results are consistent with the research data set. RMSEA is satisfactory.

Table 5: Results for testing structural equation model

The relationship between the factors			Unstandardized Coefficients	Standardized Coefficients	Std. Error	C.R	P-value
CBS	<---	Emp	0.196	0.107	0.050	3.896	***
CBS	<---	Tec	0.147	0.096	0.043	3.442	***
CBS	<---	Cri	0.082	0.069	0.028	2.875	0.004
CBS	<---	Man	0.084	0.092	0.026	3.179	0.001
CBS	<---	Com	0.070	0.079	0.025	2.856	0.004
CBS	<---	Rel	0.491	0.530	0.027	18.331	***
CBS	<---	Tan	0.140	0.146	0.028	5.024	***
CBS	<---	Res	0.080	0.095	0.023	3.533	***

Source: Prepared by the authors (2022)

Table 5 shows that the SEM model test results are satisfactory. The values of the regression coefficients are positive and statistically significant because the column “P-value” is less than 0.05. The impact of reliability (Rel) on service quality at Vietnamese commercial banks weighs 0.157 with a deviation of 0.018 (p = 0.000). That is, reliability (Rel) positively impacts service quality at Vietnamese commercial banks. The impact of reliability (Rel) on banking services at Vietnamese commercial banks weighs 0.491 with a deviation of 0.027 (p = 0.000). That is, reliability (Rel) positively impacts banking services at Vietnamese commercial banks. The impact of empathy (Emp) on service quality at Vietnamese commercial banks weighs 0.134 with a deviation of 0.028 (p = 0.000). That is, empathy positively impacts service quality at Vietnamese commercial banks. The impact of empathy (Emp) on banking services at Vietnamese commercial banks weighs 0.196 with a deviation of 0.050 (p = 0.000). That is, empathy positively impacts banking services at Vietnamese commercial banks.

Table 6: Testing the research model by Bootstrap method

The relationship between the factors			SE	SE-SE	Mean	Bias	SE-Bias
CBS	<---	Emp	0.083	0.001	0.167	-0.029	0.001
CBS	<---	Tec	0.042	0.000	0.144	-0.003	0.000
CBS	<---	Cri	0.033	0.000	0.077	-0.005	0.000
CBS	<---	Man	0.030	0.000	0.084	0.000	0.000
CBS	<---	Com	0.025	0.000	0.066	-0.004	0.000
CBS	<---	Rel	0.038	0.000	0.490	0.000	0.000
CBS	<---	Tan	0.035	0.000	0.138	-0.001	0.000
CBS	<---	Res	0.022	0.000	0.076	-0.004	0.000

Source: Prepared by the authors (2022)

Table 6 shows the implemented Bootstrap method with a repeated sample of N = 10,000 customers in this study. Besides, Amos software will now select 10,000 pieces by substitution with the repetition method from a crowd of n = 917 observations. The estimated results from 10,000 samples (average of regression weights) with standard deviation are presented as follows. The results of testing the SEM model through estimation by the Bootstrap method with N = 10,000 are satisfactory. The values of the regression coefficients are positive and statistically significant because the column “Bias” is tiny.

Policy implications for reliability (Rel): Bank employees must make transactions accurately and without errors. Apologies for mistakes can be forgiven and ignored in other service industries. Still, in the banking and financial sector, where absolute accuracy of numbers is required, apologies for making mistakes will decrease confidence and increase customers’ doubts about the bank. Therefore, commercial banks must trust customers to feel secure when using banking services, especially savings deposit services. Strengthen the dissemination and training of business processes on a weekly/monthly basis to improve management knowledge, professional qualifications, computer skills, consulting skills for customers, and good communication skills for customers and staff.

Policy implications for tangibles (Tan): Employees of commercial banks should have a very professional demeanor and dress neatly and politely when communicating with customers. Banks must design documents, forms, and vouchers used in transactions to be simple, straightforward, and easy to implement. In addition, the Internet connection system connecting transaction points and Head Office throughout the system is still limited. There are still network errors, overloaded servers, crashes, etc., access to the web to check information, and slow transactions, causing customers to lose time waiting or not make transactions for customers.

Policy implications for empathy (Emp): Bankers need to build good relationships and respond to their customers’ needs with a show of care: the ability to listen to customers is a

critical factor in providing excellent service for any reason. Not only pay attention to the customer's interaction with the individual but also be attentive and attentive to the feedback that employees receive from the channels that record customers' comments on service quality, such as the bank's revised customer care center system and suggestion box. No customer feels satisfied when coming to a bank whose voice is almost unnoticed or repeated many times. In addition, commercial banks should have a policy of asking, congratulating, and giving gifts to customers every Tet holiday. When customers need support, employees must be ready to support customers by advising customers - consulting, and helping customers complete all procedures and documents according to regulations.

Policy implications for technology (Tec): To give customers complete peace of mind about the bank's security, safety, and network security. The bank promotes innovation and application of modern technologies through the formulation and strategic planning of IT development of the financial and banking sectors' modern technology of Industry 4.0. Banks must apply the industrial revolution 4.0 because this new wave of technology also creates apparent changes in the banking sector, significantly changing distribution channels and traditional banking products and services systems. Banks need to develop appropriate solutions and cooperate with technology companies because that is an opportunity for banks to receive new technologies and human resources with high technical expertise, helping them. The bank can reduce the time and cost of researching new technology products.

Policy implications for responsiveness (Res): Banks must build a professional hotline to serve customers. Commercial banks must satisfactorily solve all customers' difficulties, questions, and complaints through the hotline 24/24. This factor is the next move after the document requesting the State Bank's branches in provinces and cities to set up a hotline to receive and promptly and thoroughly handle petitions, proposals, difficulties, and problems of people, businesses, and associations the area at the weekend. Banks need to build risk management skills: new risks are incredibly diverse in digitizing banking services.

Policy implications for management capacity (Man): To satisfy customers entirely with the bank's quality human resources. Banks need to have policies to attract high-quality human resources in the high-tech sector. Banks need to have guidelines on recruitment, remuneration, and use of talent attraction to serve the long-term development of the bank. In the digital era, especially before the impact of the fourth industrial revolution (Industry 4.0), technology is not merely a supporting tool. Still, it has become a factor that substantially impacts the banking governance of commercial goods. The products of the Fourth Industrial Revolution have

entirely changed, from nature to banking business activities, posing many new requirements and new challenges for governance.

Policy implications for competence (Com): Employees need to handle transactions correctly, quickly, politely, graciously, and efficiently with customers at commercial banks. Banks re-examine the current products provided to customers, re-evaluate each product and service to meet customer requirements, and bring profits to the bank. Good products meet customer needs, have the potential for development, need to improve efficiency, take measures to increase the attractiveness of products, and encourage customers to use them. Products that do not meet the requirements or have no development potential which removed from the product list.

Policy implications for crisis (Cri): The bank must continue diversifying its goods and services by utilizing cutting-edge technology. Bank leaders need to be aware that the Covid-19 pandemic has created many difficulties and challenges for banks and increased terrible debts to have a timely response plan. The global financial crisis proved that the road to success for banks had unpredictable thorns. It also shows that solid bank governance is crucial to helping banks manage the impact of unexpected crises.

## CONCLUSION

The quality of banking services is a prerequisite for a bank's success. Maintaining and continuously improving service quality by meeting customer needs and making them satisfied is a measure and key to the bank's success. To assist Vietnamese commercial banks in realizing the importance of high-quality banking services and developing suitable and effective policies for consumers who use banking services. The research has carried out the following studies the following content. The authors summarize the study's preliminary results, propose policy implications, contributions, and limitations, and propose future research directions. The demographic analysis results show no differences in gender, marital status, age, income, and occupation that do not affect the quality of banking services at bank trade in Vietnam at the 5% significance level.

In addition, the authors surveyed 1,000 customers using banking services at ten commercial banks in Vietnam, and the result was 917 votes. The rate is 91.7%. The research results show the reliability of the scale applied through Cronbach's Alpha coefficient, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and linear structural model analysis (SEM). The results show that eight factors positively affect banking services at

Vietnamese commercial banks, with a significance level of 5%. Eight factors include (1) technology (Tec), (2) Reliability (Rel), (3) Responsiveness (Res), (4) management capacity (Man), (5) Competence (Com), (6) Empathy (Emp), (7) Tangible (Tan) and (8) Crisis (Cri). In addition, the results also show that six factors positively influence the quality of banking services at Vietnamese commercial banks, with a significance level of 5%. Research results applied SPSS 20.0 and Amos software. The results are also essential scientific evidence for researchers and policymakers for Vietnamese commercial banks to use the research results to improve the quality of banking services through the normalized regression coefficient from high to low.

Limitations of the research and suggestions for further study: This paper has solved the set research objectives, but there is still a limitation: the random sampling method. The limit of the article is that the research model had 1,000 customers representing five big cities in Vietnam compared to the total number of customers of all commercial banks, and many other factors did not take into account. It is to overcome the limitations and weaknesses and minimize errors, and further studies should be carried out in broader and more in-depth. This study needs to increase reliability, and further research should increase the number of survey samples in commercial banks in many other provinces and cities in Vietnam. At the same time, factors such as organizational culture, marketing activities, etc., affect the quality of banking services at commercial banks. In addition, studies can compare the importance of factors affecting the quality of banking services.

## ACKNOWLEDGMENTS

The study was supported by Lac Hong University.

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