

# A Study on the Usage Factors of Mobile Banking Apps by Korean Banks in Vietnam: Focused on the Viewpoints of App User and App Provider\*

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## Abstract

**Purpose** – Vietnam has the fastest growing digital economy in Southeast Asia and is emerging as a critical overseas market for Korean banks in the post-COVID-19 era. Accordingly, many Korean banks entered the Vietnamese market to overcome the limitations of the saturated domestic financial market and create new revenue sources. This study examined the current status of digital finance in Vietnam and the cases of Korean banks that have succeeded in the Vietnamese market. Then, importance-performance analysis (IPA) was conducted on local customers, managers and staff members of Korean banks in Vietnam.

**Design/methodology** – In this study, we analyzed the importance and satisfaction factors of mobile banking app usage in Vietnam through IPA. In particular, we identified the differences between the two groups by considering the viewpoint of customers who use mobile banking apps and that of managers and staff members who provide mobile banking services.

**Findings** – The IPA results from the customer group and managers and staff members group were generally similar, but differences were observed in Ease of Use (Technology), Innovativeness (Organization), and Increase in Revenue (Economic). In the case of the customer group, Ease of Use (Technology) is located in the second quadrant, which shows low satisfaction compared to high importance. However, in the managers and staff members group, Ease of Use (Technology) is located in the first quadrant, which indicates high importance and high satisfaction. This difference in perception can cause complaints from local customers; thus, it is necessary to change the perception of the technological aspect for ease of use of mobile banking apps in consideration of the customer's position. In addition, it is necessary to allocate the resources invested in the Innovativeness (Organization) and Increase in Revenue (Economic) to Ease of Use (Technology).

**Originality/value** – In this study, based on the HOTE framework, factors for using mobile banking apps were derived, and IPA was conducted targeting local customers (app user) and managers and staff members (app provider) of Korean banks in Vietnam. Through this, we presented the results of empirical analysis that can help Korean banks efficiently utilize limited resources and budgets.

**Keywords:** Importance-Performance Analysis (IPA), Korean Banks, Mobile Banking App, Vietnamese Market

**JEL Classifications:** M16, M31, O53

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## 1. Introduction

Recently, the Korean economy has faced difficulties due to social structural changes in low growth, low birth rate, and aging. This is also affecting the Korean financial industry and could be a factor that will deteriorate the growth engine and profitability of Korean financial institutions in the future (Yoon Kyoung-Soo et al, 2017). In addition, Korean financial institutions are facing new challenges due to the uncertain business environment in the post-COVID-19 era and the spread of digital finance following the changes of the 4th Industrial Revolution (Kim Kwang-Hyun and Lee Sun-Hye, 2022). In this situation, not only FinTech companies but also BigTech companies that have large online platforms are entering the financial industry (Frost et al., 2019; Gomber, Koch and Siering, 2017; Suh Mun-Seok and Kim Dong-Ho, 2019). Currently, with the launch of Internet banks such as K-Bank, Kakao Bank, and Toss Bank in Korea, traditional financial institutions are actively seeking alternatives for survival and sustainable growth. In particular, traditional banks are strengthening customer accessibility and convenience through mobile instead of reducing the number of face-to-face transactions and branches as the proportion of non-face-to-face transactions increases with the development of Internet banking, which includes mobile banking. This means that as competition between banks for services through the mobile channel intensifies, providing a platform that is elaborately customized to customers is considered as a top priority for banking operations (Park Chae-Jin and Ryu Doo-Jin, 2018). In addition, considering the competitive environment of the Korean financial industry, which is expected to develop more fiercely in the future, Korean banks must advance into overseas markets for sustainable growth. Korean banks are making a full-fledged overseas expansion with aggressive strategies through mergers and acquisitions in the overseas market based on their abundant capital and external reliability (Song Min-Kyu, 2015).

According to the Financial Supervisory Service (2022), there were 204 overseas branches in 39 countries at the end of 2021, of which 141 branches in Asia accounted for 69.1%. In particular, Vietnam has 19 overseas branches, and as of 2021, the assets of overseas branches increased by 16.0% from the previous year to 13.59 billion USD. Vietnam has achieved rapid economic growth since its economic opening, and it is expected to achieve the fastest digital economic growth rate in Southeast Asia, with the digital economy gross merchandise volume (GMV) increasing 31% annually from 23 billion USD in 2022 to 49 billion USD in 2025. Moreover, digital finance, including electronic payments, deposits, and investment, is also expected to grow steadily over the next 3 years (Lee Hee-Sang, 2022). In addition, Vietnam is strengthening its position as a base for Southeast Asian trade by expanding its trade base through FTAs with Korea, and it is emerging as a critical overseas market for Korean financial institutions in the post-COVID-19 era due to its high future growth potential (Lee Jang-Rho, Moon Hee-Cheol and Lee Chun-Su, 2022). Accordingly, many Korean banks have entered the Vietnamese market to overcome the saturation of the Korean financial market and create new sources of revenue, and they are striving to enhance their digital capabilities to expand their influence in the Vietnamese financial market. In particular, as consumers' smartphone penetration rate and mobile banking usage rate continue to increase in Vietnam, there is a growing need to derive factors for using mobile banking apps, which are essential tools for using mobile banking, and analyze their level of importance and satisfaction.

Therefore, this paper examined the current status and prospects of Vietnamese digital finance and examined the case of Shinhan Bank and Woori Bank's entry into the Vietnamese

market. In this study, based on the HOTE framework, factors for using mobile banking apps were derived, and importance-performance analysis (IPA) was conducted targeting local customers (app user) and managers and staff members (app provider) of Korean banks in Vietnam. The results of the empirical analysis can help Korean banks efficiently utilize limited resources and budgets.

Most of the existing studies related to mobile banking have focused on the technology aspect using the technology acceptance model (Kim Suk-Gyoo, 2023). On the other hand, this study deals with the factors of using mobile banking apps in various aspects based on the HOTE framework. In addition, it is differentiated from existing studies in that it provides implications according to the difference in the perspective of each group that cannot be provided in existing studies by comparing the perspectives of app users and app providers.

This study is expected to provide insights and implications that can help Korean banks in the Vietnam to successfully explore the local market and secure a customer base for profit generation by strengthening their digital capabilities.

## 2. Theoretical Background

### 2.1. Current Status of Digital Finance and Korean Banks in Vietnam

As of 2020, the total population of Vietnam is 93 million, of which 28 million, or 30%, have accounts at commercial banks. In addition, about 5.6 million people, or 20% of the population with commercial bank accounts, are using the Internet or mobile (i.e., digital banking). Demand for digital banking continues to surge in Vietnam, and unlike Korea, where mobile finance was introduced after Internet-based financial transactions reached a certain level, Vietnam introduced a mobile payment market with digitalization. In Vietnam, the main class using digital finance includes consumers living in the major cities of Hanoi and Ho Chi Minh City; 50% of the cities' residents conduct bank transactions non-face-to-face, and the smartphone usage rate reaches 84%. As of 2020, the size of the digital marketing market in Vietnam was about 289.95 million USD, continuing to increase. In addition, as of January 2020, 68.17 million people—or 70% of Vietnam's population—used the Internet, and the social media usage rate reached 67% (Lee Hyo-Young, 2021).

Korean banks are currently entering the Vietnamese financial market, having paid attention to its growth potential. As of the end of 2021, 11 Korean banks entered Vietnam (Shinhan Bank, Woori Bank, Kookmin Bank, Industrial Bank of Korea, KEB Hana Bank, Nonghyup Bank, Busan Bank, Daegu Bank, Kwangju Bank, Korea Development Bank, and Export-Import Bank of Korea) and operated a total of 19 overseas branches (four local subsidiaries, nine branches, and six offices). As of the end of 2020, the total assets of Korean banks operating in Vietnam were about 11.67 billion USD, an increase of about 3.27 billion USD from about 8.4 billion USD in the previous year. Of these, Shinhan Bank Vietnam accounted for about 5.78 billion USD, and Woori Bank Vietnam accounted for about 2.06 billion USD—49.5% and 17.6% of the total assets of Korean banks, respectively (Financial Supervisory Service, 2022).

As such, Vietnam's digital economy is growing the fastest in Southeast Asia, and digital finance is also expected to grow steadily over the next 3 years (Lee Hee-Sang, 2022). Accordingly, the Vietnamese market is expected to emerge as a critical overseas market for Korean banks in the post-COVID-19 era.

## 2.2. Success Cases of Korean Banks Entering Vietnam

### 2.2.1. Shinhan Bank

Shinhan Bank is moving away from the saturated Korean market to create new sources of income and strengthen its global business for future growth. Shinhan Bank's representative overseas market success case is Shinhan Bank Vietnam's acquisition of ANZ Bank Vietnam's retail division in 2017. Shinhan Bank Vietnam has become the No. 1 foreign bank in Vietnam, with total assets of 3.3 billion USD, 240,000 credit card members, 900,000 customers, and 1,400 executives and employees since its acquisition of ANZ Bank Vietnam's retail division (Shinhan Bank, 2022).

Currently, Shinhan Bank Vietnam is promoting various projects to grow into a digital financial company in Vietnam and has launched its mobile banking app "SOL," partnering with Vietnam's national messenger "Zalo" with platform-based credit cards and loan products. In addition, Shinhan Bank Vietnam developed private label credit card (PLCC) and buy now pay later (BNPL) products after investing in "Tiki," a leading E-Commerce company with 20 million customers in Vietnam, and it started credit loans and overseas remittance services with "MOMO," Vietnam's No. 1 electronic wallet platform. Based on these efforts to lead the digital trend in Vietnam, Shinhan Bank Vietnam is currently considered the largest foreign bank in the country, and as of the end of 2021, it has been steadily growing despite the influence of COVID-19, recording a net profit of 127.6 billion KRW and total assets of about 8.33 trillion KRW (Jung Hye-Yeon, 2022).

### 2.2.2. Woori Bank

Woori Bank entered the Vietnamese market after being attracted by Vietnam's high economic growth rate, rapidly growing economic and cultural exchanges between Korea and Vietnam, and the high growth potential of Vietnam's local retail finance market. It pursued a strategy to strengthen its digital financial capabilities to differentiate itself from local banks in Vietnam. Specifically, it provides services differentiated from local banks based on firm banking services that handle financial affairs online and advanced IT technologies. Recently, it has launched a mobile banking app called "Won" to strengthen its digital financial competitiveness in the Vietnamese market. In addition, Woori Bank closely observes the current status of the Vietnamese market, develops customized products suitable for local culture, emotions, and systems, and promotes a strategy to reach out to customers by converting the weaknesses of local banks into its strengths in Vietnam. In addition, Woori Bank operates a product development team centered on local employees and expands its contact points with customers through localization via active business partnerships with local companies (Lee Hee-Sang, 2018; Woori Bank, 2022). Based on these efforts, Woori Bank Vietnam continues to grow in the Vietnamese market, achieving 2.9 billion USD in assets and 19 million USD in net profit as of the first half of 2022 (Yoon Joon-Ho, 2022).

## 2.3. TOE, HOT-fit, HOTE Framework

The TOE framework is a research model proposed by Tornatzky and Fleischer (1990) to explain the factors that influence the process of an organization's acceptance of information technology from three contexts (technological, organizational, and environmental). The TOE framework has been applied to related corporate research as the most suitable framework for explaining technology acceptance, diffusion, and homogeneity from an organizational per-

spective. As such, the TOE framework, which considers the internal and external environmental and technical context as the main factors in terms of the organization, has been tested for effectiveness by empirical studies related to the introduction and spread of various technologies. In addition, the TOE framework is expanding research models and research topics by combining various research methods (Ahmadi, Nilashi and Ibrahim, 2015; Gangwar, Date and Ramaswamy, 2015; Ilin, Ivetić and Simić, 2017; Oliveira, Thomas and Espadanal, 2014; Wang, Wang and Yang, 2010).

Meanwhile, Yusof et al. (2008) critically evaluated the TOE framework and then developed a new HOT-fit framework based on human, organizational, and technological suitability. The HOT-fit framework has three aspects and different dimensions in all aspects. In terms of technology, it includes three dimensions: (1) system quality, (2) information quality, and (3) service quality. In terms of human suitability, it comprises two: (1) system usage and (2) user satisfaction. In terms of organization, it has two dimensions: (1) structure and (2) environment (Erlirianto, Ali and Herdiyantia, 2015).

Further, Marques et al. (2011) proposed the addition of environmental factors to the HOT-fit framework to study the acceptance of the medical records system (MRS) in Europe and derived the human, organization, technology, and environment (HOTE) framework, which combines the TOE framework and the HOT-fit framework. The proposed framework addresses four aspects that influence acceptance of information and communication technology (ICT): (1) technology aspects, including equipment and processes; (2) organization aspects, such as size, localization, and management structure; (3) human aspects related to user involvement; and (4) environmental aspects, including the country's cultural environment and regulatory influences.

In this study, based on the HOTE framework that combines the TOE and HOT-fit framework, factors for using mobile banking apps by Korean banks that have entered Vietnam were derived. This is because the HOTE framework is suitable for deriving factors that influence the process of organizations' acceptance of information technology in various aspects (human, organization, technology, and environment). Moreover, IPA was conducted targeting local customers, managers and staff members of Korean banks in Vietnam. In this way, we tried to present insights and implications that can help Korean banks efficiently utilize limited resources and budgets through selection and concentration.

#### 2.4. Factors of Mobile Banking App Usage

The various expected effects that banks can enjoy through mobile banking are as follows. First, mobile banking reduces their costs through the automation of banking business. Banking business processing through existing store operation requires a significant cost, such as store operation and employment; on the other hand, mobile banking significantly reduces costs in banks' payment and retail deposits (Laukkanen and Lauronen, 2005). Second, banks can secure competitiveness in the financial market by utilizing mobile banking. Recently, financial institutions have been expanding their scale through large-scale mergers and acquisitions, and competition is intensifying as restrictions on work areas between financial institutions are abolished. To respond to such increasingly fierce competition, banks are providing mobile banking services, which are maintaining existing customers and securing new ones (Kwon Young-Mo, 2015). Third, financial transaction time can be expanded, which can increase the profits of financial institutions. Mobile banking services reduce dependence on labor force in financial transactions, making it easy for financial institutions to expand

financial transaction hours. In addition, since financial transactions are possible anytime and anywhere, profits can be expected to increase accordingly (Mallat, Rossi and Tuunainen, 2004). Finally, mobile banking services can be expected to expand customer contact points. Mobile banking is emerging as the biggest customer contact point for banks because customers can shorten the time required for financial services through mobile banking and conveniently use financial services without time and space constraints (Lee Soo-Yeon and Park Jo-Won, 2016).

In the meantime, many researchers have organized mobile banking service items to examine the determinants affecting the use of mobile banking and provided useful information for the introduction of mobile technology. Existing studies related to mobile banking have mainly focused on applying the technology acceptance model (TAM). In addition, some existing studies have combined theory of planned behavior (TPB) and innovation diffusion theory (IDT), and others have applied theory of reasoned action (TRA), social cognitive theory (SCT), and unified theory of acceptance and use of technology (UTAUT; Lederer et al., 2000; Liao and Cheung, 2002; Luarn and Lin, 2005; Tan and Teo, 2000).

Furthermore, studies have recently been conducted through HOTE frameworks that combine TOE and HOTE-fit frameworks. Baek Sun-Wook (2019) presented factors and sub-factors that influence the intention to use the mobile banking application based on the HOTE framework. Specifically, an empirical analysis was conducted by focusing on technology (security, compatibility, ease of use), human (usefulness, self-efficacy, acceptability, credibility), organization (innovativeness, public relations, top management support), economic (deposit interest rate, loan interest rate, perceived cost), and environment (competitive pressure, government regulations, social influence).

### 3. Empirical Method and Data

#### 3.1. Research Method

This study analyzed the importance and satisfaction factors related to the use of mobile banking apps by Korean banks that have entered Vietnam from the viewpoint of customers using the service and that of managers and staff members providing it. In this study, IPA was performed to compare the importance and satisfaction of the factors using the mobile banking app.

IPA is useful for efficiently utilizing limited resources and budgets by visualizing evaluation attributes in the quadrants. Therefore, it facilitates the planning and decision-making of companies from a strategic point of view, and is highly utilized in practice as it can evaluate various and complex problems (Sohn Seong-Min et al., 2020).

IPA can visualize which attributes should be improved in relative importance and priority by marking the importance and performance on the quadrants of each attribute. In IPA, the X-axis represents performance, and the Y-axis represents importance, and it is divided into "Keep up the good work," "Concentrate here," "Low priority," and "Possible overkill" areas according to the location of each quadrant.

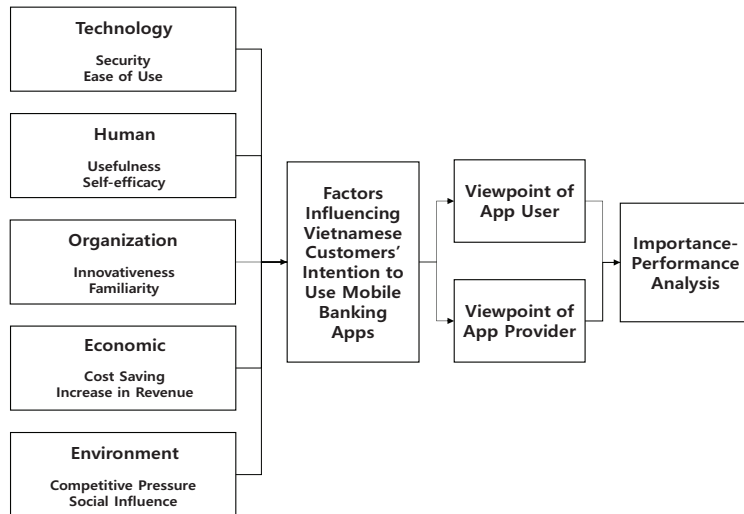
The "Keep up the good work" area in the first quadrant has high importance and satisfaction, meaning that items belonging to that area have high competitiveness; therefore, these factors are areas that require efforts to maintain the current status. The second quadrant, the "Concentrate here" area, has high importance but low satisfaction, and factors

belonging to the area require urgent improvement, and intensive investment should be made to increase satisfaction. The “Low priority” area, which is the third quadrant, has low importance and satisfaction. Factors belonging to this area require efforts to increase satisfaction, but they do not need to be improved urgently; thus, the need for additional investment or resource allocation to improve satisfaction is relatively low. The fourth quadrant, the “Possible overkill” area, has low importance but high satisfaction, and it is more efficient to invest resources in other factors than in factors belonging to this area (Lee Chun-Su, Lee You-Kyung and Kim Seog-Soo, 2022).

### 3.2. Conceptual Framework for Research

The conceptual framework of this study is shown in Fig. 1, and based on the HOTE framework used in the study by Baek Sun-Wook (2019), Korean banks’ mobile banking app usage factors in Vietnam were derived. The reason is that the HOTE framework used in the study of Baek Sun-Wook (2019) was judged to be suitable for deriving factors that affect the intention to use mobile banking apps in various aspects (human, organization, technology, economic and environment). We also conducted IPA on local customers, managers and staff members of Korean banks to derive insights and implications that can help Korean banks in Vietnam efficiently provide mobile banking services.

**Fig. 1.** Conceptual Framework



In this study, the mobile banking app usage factors derived based on previous studies on the HOTE framework and mobile banking services consisted of five factors (Technology, Human, Organization, Economic, Environment) and 10 sub-factors (Security, Ease of Use, Usefulness, Self-efficacy, Innovativeness, Familiarity, Cost Saving, Increase in Revenue, Competitive Pressure, and Social Influence). Sub-factors of each factor adopted sub-factors that fit the purpose of this study among the sub-factors used in the studies of Albashrawi and Motiwalla (2019), Baabdullah et al. (2019), Baek Sun-Wook (2019), Kim Tae-Hyoung (2018), and Pietro et al. (2015), except for the Familiarity (Organization).

### 3.3. Measurement Items of Factors and Details

The measurement items and details of each factor for mobile banking app usage are as follows. The mobile banking app usage factors consisted of the 10 measurement items, and a survey was conducted. Details of each measurement item were established by referring to previous studies, and the contents are shown in detail in Table 1. Through the measurement items presented in Table 1, importance and satisfaction were measured for local customers, managers and staff members of Korean banks in Vietnam. As the importance and satisfaction of mobile banking app users and service providers may differ, we analyze the difference and provide useful information and implications for the operation of mobile banking services of Korean banks entering Vietnam.

**Table 1.** Description of Mobile Banking App Usage Measurement Items

Factors	Sub-factors	Details (Importance/Satisfaction)	Previous Research
Technology	Security	The degree to which customers can use the mobile banking app free from external risks such as personal information leakage or hacking.	Albashrawi and Motiwalla (2019); Baabdullah et al. (2019); Pietro et al. (2015)
	Ease of Use	The degree to which customers can use mobile banking apps without difficulty.	
Human	Usefulness	The degree to which customers feel that the use of mobile banking apps is suitable for their personal purposes and useful to them.	Liu, Ngai and Ju (2019); Martins, Oliveira and Popović (2014); Pietro et al. (2015)
	Self-efficacy	The degree to which the customer has the necessary skills or knowledge to use the mobile banking app.	
Organization	Innovativeness	The degree to which customers accept and understand changes due to new features or upgrades of mobile banking apps.	Baek Sun-Wook (2019); Kim Suk-Gyoo (2023); Kim Tae-Hyoung (2018)
	Familiarity	The degree to which customers feel familiar with their interactions with banks through the use of mobile banking apps.	
Economic	Cost Saving	The degree to which one believes they can save money by waiving fees when using mobile banking apps.	Baek Sun-Wook (2019); Kim Suk-Gyoo (2023)
	Increase in Revenue	The degree to which one feels that financial-related revenue increases while using mobile banking apps.	
Environment	Competitive Pressure	The degree to which competitors threaten the churn of existing customers by strengthening their mobile banking app services.	Ahmadi, Nilashi and Ibrahim (2015); Baabdullah et al. (2019); Gangwar, Date and Ramaswamy (2015)
	Social Influence	The degree to which customers believe that people around them (e.g. family and friends) should also use mobile banking apps.	



## 4. Empirical Analysis

### 4.1. Demographic Characteristics of Respondents

In this study, the survey was conducted through a mobile survey, targeting customers, managers and staff members of Shinhan Bank Vietnam and Woori Bank Vietnam, mainly in Ho Chi Minh City. The survey period was conducted for about one month from July 30 to August 30, 2022. Among the collected questionnaires, 118 (customers) and 195 (managers and staff members) valid questionnaires were used for empirical analysis, excluding those with poor responses. Table 2 shows the demographic characteristics of the respondents who participated in the survey in this study. First, in the case of customers, there were 73 females (61.9%) and 45 males (38.1%); thus, the proportion of females was higher than that of males. In terms of employment status, 101 were office workers (85.6%), and 17 had other jobs

**Table 2.** Demographic Characteristics of Respondents

Customers [n=118]		Frequency Rate (%)		Managers and Staff Members [n=195]		Frequency Rate (%)	
Gender	Male	45	38.1	Gender	Male	72	36.9
	Female	73	61.9		Female	123	63.1
Employment Status	Office Worker	101	85.6	Position	Manager	51	26.2
	Others (Students, etc.)	17	14.4		Staff	144	73.8
Age	20-29 years	30	25.4	Age	20-29 years	30	15.4
	30-39 years	66	55.9		30-39 years	131	67.2
	40-49 years	15	12.7		40-49 years	30	15.4
	Older than 50 years	7	5.9		Older than 50 years	4	2.1
Educational Level	High school or less	9	7.6	Educational Level	High school or less	5	2.6
	University	92	78.0		University	150	76.9
	Graduate school (Master's degree) or more	17	14.4		Graduate school (Master's degree) or more	40	20.5
Ability to Use Mobile Banking Apps	Low	3	2.5	Work Experience	Less than 5 years	78	40.0
	Medium	62	52.5		5 years or more to less than 10 years	67	34.4
	High	53	44.9		10 years or more	50	25.6
	Total	118	100.0		Total	195	100.0

(14.4%). In terms of age, 66 people (55.9%) were in their 30s, 30 people (25.4%) in their 20s, 15 people (12.7%) in their 40s, and seven people (5.9%) in their 50s and older. In terms of educational level, 92 people (78.0%) had graduated from university; 17 people (14.4%) had graduated from graduate school or higher, and 9 people (7.6%) had graduated from high school or lower; therefore, it was found that customers' level of education was relatively high. In terms of ability to use mobile banking apps, there were 62 people (52.5%) in the medium level, 53 people (44.9%) in the high level, and three people (2.5%) in the low level. Therefore, it was found that the customers' ability to use the mobile banking app was above the medium level.

Next, in the case of managers and staff members, 123 were females (63.1%) and 72 males (36.9%); thus, the proportion of females was higher than that of males. In terms of position, 144 were staff members (73.8%) and 51 managers (26.2%). In terms of age, there were 131 people (67.2%) in their 30s, 30 people (15.4%) in their 20s, 30 people (15.4%) in their 40s, and four people (2.1%) in their 50s and older. In terms of educational level, 150 people (76.9%) had graduated from university; 40 people (20.5%) had graduated from graduate school or higher, and five people (2.6%) had graduated from high school or lower; therefore, it was found that the level of education of managers and staff members was very high.

In terms of work experience, 78 people (40.0%) had less than 5 years of experience; 67 people (34.4%) had 5 or more years but less than 10 years of experience, and 50 people (25.6%) had 10 years of experience or more. Therefore, respondents in the managers and staff members groups who had participated in the survey appeared to have abundant experience in providing financial services.

## 4.2. Reliability Analysis

In this study, reliability analysis was conducted using Cronbach's alpha coefficient to verify the reliability of the measurement items. The reliability analysis results are shown in Table 3. The importance and satisfaction of the customer group and the managers and staff members group all showed a Cronbach's alpha coefficient of 0.7 or higher, indicating that the reliability of the measurement items used in this study was secured.

**Table 3.** Results of Reliability Analysis

Factors	Sub-factors	Customers		Managers and Staff Members	
		Importance Cronbach's $\alpha$	Satisfaction Cronbach's $\alpha$	Importance Cronbach's $\alpha$	Satisfaction Cronbach's $\alpha$
Technology	Security	.855	.909	.836	.861
	Ease of Use				
Human	Usefulness	.927	.918	.927	.891
	Self-efficacy				
Organization	Innovativeness	.900	.923	.828	.815
	Familiarity				
Economic	Cost Saving	.902	.865	.841	.840
	Increase in Revenue				
Environment	Competitive Pressure	.856	.880	.757	.857
	Social Influence				

### 4.3. Paired t-test Results

#### 4.3.1. Viewpoint of Customers

This study investigated the importance and satisfaction of local customers who use mobile banking apps of Korean banks and managers and staff members who operate mobile banking apps in Vietnam, and it used paired t-test and IPA techniques to analyze the difference between app users and app providers' perspectives.

Table 4 is the results of the paired t-test conducted by 118 customers to understand the difference between importance and satisfaction for the measurement items. Specifically, significant differences are observed in Security and Ease of Use (Technology), Self-efficacy (Human), Familiarity (Organization), and Cost Saving (Economic). Overall, importance (4.043) was found to exceed satisfaction (3.889). This suggests that Korean banks' mobile banking apps are currently operating at an overall low level of satisfaction with local customers. In particular, in case of Ease of Use (Technology), the difference between importance and satisfaction is the largest compared to other items, suggesting that it is most urgent to prepare improvement measures for this part.

**Table 4.** Analysis of the Difference between Importance and Satisfaction (Customers)

Factors	Sub-factors	Importance		Satisfaction		Mean Difference	t-value
		Mean	S.D.	Mean	S.D.		
Technology	Security	4.279	0.990	3.949	0.928	0.330	4.489 ***
	Ease of Use	4.203	0.878	3.855	0.932	0.348	5.564 ***
Human	Usefulness	4.093	0.974	4.025	0.960	0.068	0.913
	Self-efficacy	4.135	0.982	4.000	0.934	0.135	1.787 *
Organization	Innovativeness	3.932	0.989	3.940	0.923	-0.008	-0.123
	Familiarity	3.983	0.929	3.762	1.055	0.221	3.683 ***
Economic	Cost Saving	4.186	0.901	3.915	1.013	0.271	4.244 ***
	Increase in Revenue	3.932	0.954	3.898	0.986	0.034	0.528
Environment	Competitive Pressure	3.788	1.023	3.711	1.042	0.077	1.226
	Social Influence	3.898	0.977	3.830	1.027	0.068	1.142

Notes: 1. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

#### 4.3.2. Viewpoint of Managers and Staff Members

Table 5 is the results of the paired t-test conducted by 195 managers and staff members to understand the difference in importance and satisfaction with the measurement items. Specifically, significant differences exist in Security (Technology), Self-efficacy (Human), Innovativeness (Organization), and Competitive Pressure (Environment). Importance (4.260) was found to exceed satisfaction (4.226), but the difference was not great. These results show that, contrary to the perspective of customers using mobile banking apps, managers and staff members recognize that mobile banking apps are generally operated at a level of satisfaction similar to that of importance.

**Table 5.** Analysis of the Difference between Importance and Satisfaction (Managers and Staff Members)

Factors	Sub-factors	Importance		Satisfaction		Mean Difference	t-value
		Mean	S.D.	Mean	S.D.		
Technology	Security	4.533	0.799	4.338	0.763	0.195	4.142 ***
	Ease of Use	4.369	0.851	4.358	0.767	0.011	0.230
Human	Usefulness	4.343	0.841	4.287	0.750	0.056	1.279
	Self-efficacy	4.369	0.782	4.292	0.779	0.077	1.727 *
Organization	Innovativeness	4.235	0.794	4.123	0.844	0.112	2.473 **
	Familiarity	4.179	0.837	4.164	0.793	0.015	0.334
Economic	Cost Saving	4.312	0.809	4.251	0.806	0.061	1.288
	Increase in Revenue	4.200	0.801	4.200	0.755	0.000	0.000
Environment	Competitive Pressure	3.923	0.955	4.051	0.827	-0.128	-2.414 **
	Social Influence	4.133	0.818	4.194	0.766	-0.061	-1.406

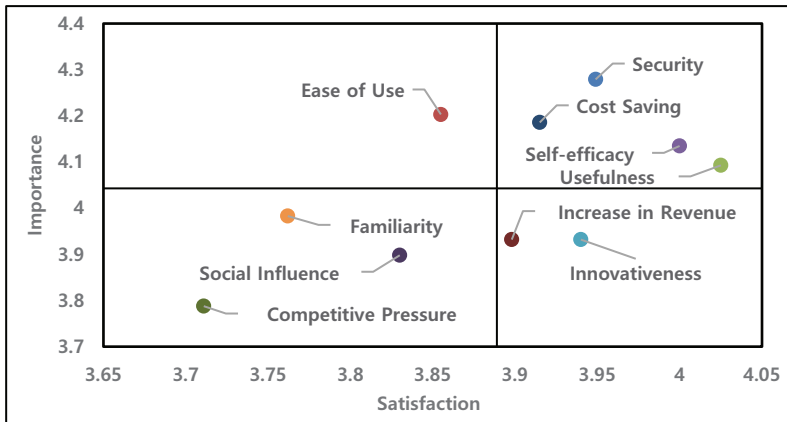
**Notes:** 1. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.001$ .

#### 4.4. IPA (Importance-Performance Analysis) Results

##### 4.4.1. Viewpoint of Customers

Fig. 2 is the results of the IPA shown on the quadrants by summarizing the results of the customers' survey on the factors of Korean banks' mobile banking app usage in Vietnam.

**Fig. 2.** IPA Results (Viewpoint of Customers)



From the customers' viewpoint, it was found that among the factors of mobile banking app usage, Security (Technology), Usefulness and Self-efficacy (Human), and Cost Saving (Economic) were located in the first quadrant, showing high importance and high satisfaction.

Ease of Use (Technology) is located in the second quadrant, which shows lower satisfaction

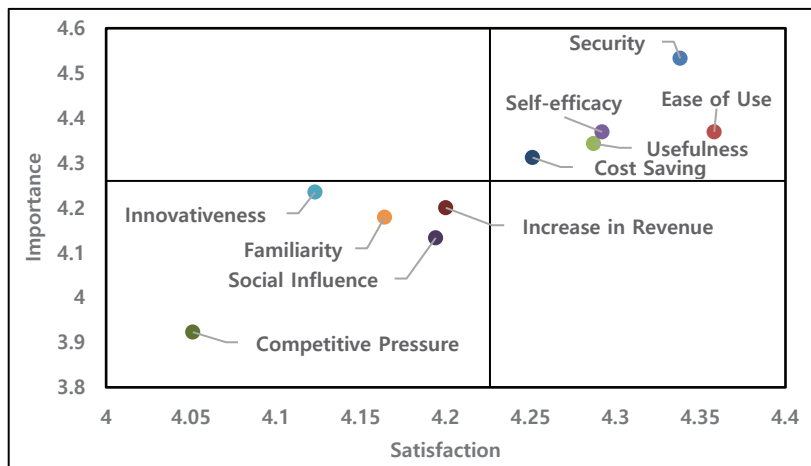
than high importance, and it is found that priority improvement measures for the factor are needed, and intensive investment is required. These results show that in Vietnam, mobile banking services are in their early stages; thus, local customers are not familiar with how to use mobile banking apps and recognize that the method of using mobile banking apps currently operated by Korean banks is complicated. The complexity of these mobile banking apps is likely to serve as an entry barrier for potential customers to use Korean banks' mobile banking apps in the future; therefore, proposing alternatives is an urgent matter. It is necessary to develop an easier and more intuitive user interface that considers the level of local consumers, so that local customers can use mobile banking apps more easily and conveniently.

Familiarity (Organization) and Competitive Pressure and Social Influence (Environment) are considered to be unnecessary areas for additional investment or resource allocation as they appear to be low priority factors located in the third quadrant showing low importance and low satisfaction. Finally, Innovativeness (Organization) and Increase in Revenue (Economic) were found to be factors that should avoid overinvestment and allocate resources to other areas by being located in the fourth quadrant, which shows higher satisfaction than low importance.

#### 4.4.2. Viewpoint of Managers and Staff Members

Fig. 3 summarizes the results of the survey from the perspective of managers and staff members on the factors of Korean banks' mobile banking app usage in Vietnam and shows the results of the IPA on quadrants.

Fig. 3. IPA Results (Viewpoint of Managers and Staff Members)



From the viewpoint of managers and staff members, among the factors, Security and Ease of Use (Technology), Usefulness and Self-efficacy (Human), and Cost Saving (Economic) are located in the first quadrant, showing high importance and high satisfaction; in other words, the factors were recognized as indispensable to maintain the level. These results are generally similar to those of the customer's perspective, but a difference exists in Ease of Use (Technology). managers and staff members have been dispatched from Korea, where mobile

banking services have developed, and are also familiar with using their mobile banking apps; thus, they tend to think that mobile banking apps are relatively easier to use than local customers. This difference in perception can cause complaints from local customers. Therefore, it is judged necessary to change the perception of the technical aspect for the easy use of the mobile banking app in consideration of the customer's position.

Innovativeness and Familiarity (Organization), Increase in Revenue (Economic), and Competitive Pressure and Social Influence (Environment) were found to be low priority factors located in the third quadrant, showing low importance and low satisfaction; in other words, it is recognized as an unnecessary area of separate additional investment or resource allocation. These results are generally judged to be similar to the customers' viewpoint, but in their case, Innovativeness (Organization) and Increase in Revenue (Economic) were recognized as factors located in the fourth quadrant, which showed higher satisfaction than the low importance. Therefore, to overcome these differences and make mobile banking apps more customer-friendly, it is necessary to change the perception of allocating resources to the Ease of Use (Technology) needing improvement.

## 5. Conclusions and Limitations

### 5.1. Summary and Implications

This study examined the current status and prospects of Vietnamese digital finance and examined the success cases of Shinhan Bank and Woori Bank's entry into the Vietnamese market. Moreover, based on the HOTE framework, IPA was conducted on local customers, managers and staff members of Korean banks. Through this, we tried to provide insights and implications that can help Korean banks that have entered the Vietnamese financial market successfully pioneer the local market and secure a customer base for profit generation by strengthening digital capabilities.

For the empirical analysis of this study, five factors of mobile banking app usage (Technology, Human, Organization, Economic, Environment) and 10 sub-factors (Security, Ease of Use, Usefulness, Self-efficacy, Innovativeness, Familiarity, Cost Saving, Increase in Revenue, Competitive Pressure, Social Influence) were derived through previous studies. Afterward, IPA was conducted based on the survey of customers, managers and staff members of Shinhan Bank Vietnam and Woori Bank Vietnam, focusing on Ho Chi Minh city.

As the results of the IPA, from the viewpoint of customers, it was found that among the factors of mobile banking app usage, Security (Technology), Usefulness and Self-efficiency (Human), and Cost Saving (Economic) were located in the first quadrant showing high importance and high satisfaction. In addition, Ease of Use (Technology) is located in the second quadrant, which shows lower satisfaction than the high importance, and it is found that priority improvement measures of the factors are needed, and intensive investment is required. Next, Familiarity (Organization) and Competitive Pressure and Social Influence (Environment) are considered unnecessary areas for additional investment or resource allocation as they appear to be low priority factors located in the third quadrant, showing low importance and low satisfaction. Finally, Innovativeness (Organization) and Increase in Revenue (Economic) were found to be factors that should avoid overinvestment and allocate resources to other areas by being located in the fourth quadrant, which shows higher

satisfaction than low importance.

From the viewpoint of managers and staff members, among the factors of mobile banking app usage, Security and Ease of Use (Technology), Usefulness and Self-efficacy (Human), Cost Saving (Economic) are located in the first quadrant. In addition, Innovativeness and Familiarity (Organization), Increase in Revenue (Economic), and Competitive Pressure and Social Influence (Environment) are found to be low priority factors located in the third quadrant.

The results of the IPA from the viewpoint of customers and that of managers and staff members showed similar results overall, but differences were noted with regard to Ease of Use (Technology), Innovativeness (Organization), and Increase in Revenue (Economic). From the viewpoint of customers, Ease of Use (Technology) is located in the second quadrant. However, from the viewpoint of managers and staff members, it was found that the factors must remain at that level by being located in the first quadrant. This difference is thought to be that managers and staff members are dispatched from Korea, where mobile banking services are developed, and are familiar with using their mobile banking apps; thus, they tend to think that mobile banking apps are relatively easier to use than local customers, and this difference in perception can cause complaints from local customers. Therefore, it is necessary to change the perception of the technical aspect for easy use of mobile banking apps in consideration of the customer's position. In addition, from the viewpoint of customers, Innovativeness (Organization) and Increase in Revenue (Economic) is located in the fourth quadrant. However, the viewpoint of managers and staff members was found to be the low priority factors located in the third quadrant. Therefore, to overcome this difference and operate mobile banking apps in a more customer-friendly, it is necessary to allocate resources to Ease of Use (Technology) that urgently need improvement.

In the absence of research on the operation of mobile banking apps by Korean banks in the Vietnamese market, this study derived the factors for mobile banking app usage of Korean banks in Vietnam and conducted IPA to find out the difference between the perspectives of local customers, managers and staff members. Through this, we provided the basis for research to find out the difference in perspective of each group. Moreover, the results of this study provide insight into the elements and priorities that Korean banks should focus on when operating mobile banking apps in the Vietnamese market. In this respect, this study has academic significance.

The practical implications that can be obtained through the results of this study are as follows. In the Vietnamese market, which has emerged as a critical overseas market for Korean banks in the post-COVID-19 era, mobile banking is expected to become more important as a means of payment due to increased demand for non-face-to-face services in the future. In this situation, Korean banks in Vietnam need to focus their resources on increasing the ease of use of their mobile banking apps in order to respond quickly to environmental changes in the Vietnamese financial market and generate high performance in the future. In addition, in order to increase the ease of use of mobile banking apps, it is judged that a lot of investment is needed in the design development of customer-friendly, intuitive and convenient mobile banking apps.

Through these efforts to operate their mobile banking apps in a customer-friendly manner, Korean banks in the Vietnamese market will be able to gain advantages in competition with other banks in the post-COVID-19 era by utilizing their resources efficiently and increasing customer satisfaction.

## 5.2. Limitations

This study is meaningful in that it aims to present empirical analysis results that can help Korean banks entering the Vietnamese market, establish customer-friendly mobile banking app operation strategies, and efficiently utilize limited resources and budgets, but it has the following limitations.

First, this study derived five mobile banking app usage factors (Technology, Human, Organization, Economic, Environment) and 10 sub-factors (Security, Ease of Use, Usefulness, Self-efficacy, Innovativeness, Familiarity, Cost Saving, Increase in Revenue, Competitive Pressure, Social Influence). This is because, if the number of sub-factors increased, the survey was conducted focusing on the most important sub-factors considering that the response may be inaccurate due to the decrease in the concentration of respondents in Vietnam. However, there exist other various factors in addition to the ones used in this study, and in the future, it will be necessary to conduct more sophisticated and multidimensional research by developing these factors and conducting surveys.

Second, the sample used for the empirical analysis of this study was limited to 118 customers and 195 managers and staff members. Although it was intended to obtain more samples, empirical analysis was conducted through a somewhat insufficient number of samples due to the limitations of conducting surveys at a remote place, namely Vietnam. Therefore, in future studies, it will be necessary to prepare a plan to obtain a larger number of samples so that more customers can reflect their opinions.

Third, this study focused on digital finance and conducted only IPA on the factors of mobile banking app usage, which is a non-face-to-face service; however, in the future, it will be necessary to conduct the IPA on the usage factors of offline branches providing face-to-face services. Through this, it is believed that research results that can help improve the performance of Korean banks by confirming the level of comprehensive financial services of Korean banks entering Vietnam and identifying priorities can be derived.

Fourth, this study does not deal with the effect of institutional and business differences in Vietnam on the mobile banking operation of Korean banks. In the Vietnamese market, there are business differences and institutional differences that do not exist in the Korean market, and these differences can have a great impact on the operation of Korean banks' mobile banking apps and entrepreneurship. Therefore, in the future, it is necessary to expand the discussion of this study by analyzing the impact of business and institutional differences in the Vietnamese market on the digital financial activities of Korean banks.

Considering these limitations, research that can provide more meaningful academic and practical implications for the performance creation of Korean banks that have entered the Vietnamese market should be conducted in the future.

## References

- Ahmadi, H., M. Nilashi and O. Ibrahim (2015), "Organizational Decision to Adopt Hospital Information System: An Empirical Investigation in the Case of Malaysian Public Hospitals", *International Journal of Medical Informatics*, 84(3), 166-188.
- Albashrawi, M. and L. Motiwalla (2019), "Privacy and Personalization in Continued Usage Intention of Mobile Banking: An Integrative Perspective", *Information Systems Frontiers*, 21(5), 1031-1043.



- Baabdullah, A. M., A. A. Alalwan, N. P. Rana, H. Kizgin and P. Patil (2019), "Consumer Use of Mobile Banking (M-Banking) in Saudi Arabia: Towards an Integrated Model", *International Journal of Information Management*, 44, 38-52.
- Baek, Sun-Wook (2019), *A Study on the Factors that Influence the Perceived Intention to the Use of Mobile Banking Applications: Focusing on the Analysis of Differences between Users and Providers* (Doctoral Dissertation), Yongin, South Korea: Dankook University.
- Erlirianto, L. M., A. H. N. Ali and A. Herdiyantia (2015), "The Implementation of the Human, Organization, and Technology-fit (HOT-fit) Framework to Evaluate the Electronic Medical Record (EMR) System in a Hospital", *Procedia Computer Science*, 72, 580-587.
- Financial Supervisory Service (2022), *Current Status of Vietnamese Banking Industry*. Available from <https://www.fss.or.kr/fss/bbs/B0000088/view.do?nttId=37978&menuNo=200117> (accessed October 26, 2022)
- Financial Supervisory Service (2022), *Management Status and Localization Indicator of Domestic Banks' Overseas Branches in 2021*. Available from <https://www.fss.or.kr/fss/bbs/B0000188/view.do?nttId=55405&menuNo=200218&cl1Cd=&sdate=&edate=&searchCnd=1&searchWrdr=&pageIndex=43> (accessed October 26, 2022)
- Frost, J., L. Gambacorta, Y. Huang, H. S. Shin and P. Zbinden (2019), "BigTech and the Changing Structure of Financial Intermediation", *Economic Policy*, 34(100), 761-799.
- Gangwar, H., H. Date and R. Ramaswamy (2015), "Understanding Determinants of Cloud Computing Adoption Using an Integrated TAM-TOE Model", *Journal of Enterprise Information Management*, 28(1), 107-130.
- Gomber, P., J. A. Koch and M. Siering (2017), "Digital Finance and FinTech: Current Research and Future Research Directions", *Journal of Business Economics*, 87(5), 537-580.
- Ilin, V., J. Ivetić and D. Simić (2017), "Understanding the Determinants of E-Business Adoption in ERP-Enabled Firms and Non-ERP-Enabled Firms: A Case Study of the Western Balkan Peninsula", *Technological Forecasting and Social Change*, 125, 206-223.
- Jung, Hye-Yeon (2022, May 25), "Shinhan Financial Group Becomes Vietnamese Largest Foreign Financial Company in 30 Years", *Shindonga*. Available from <https://shindonga.donga.com/3/all/13/3401011/1> (accessed October 29, 2022)
- Kim, Kwang-Hyun and Sun-Hye Lee (2022), "Digital Financial Services and Growth Strategies & Countermeasures: Including Fintech", *Journal of Knowledge Information Technology and Systems*, 17(4), 575-583.
- Kim, Suk-Gyoo (2023), *A Study on Strategy and Customer Satisfaction of Domestic Financial Institutions Launching into Vietnam: Focused on Mobile Banking* (Doctoral Dissertation), Busan, South Korea: Pukyong National University.
- Kim, Tae-Hyoung (2018), *The Priority Analysis of IT Adoption Factors Using AHP: Focusing on the Financial Industry* (Doctoral Dissertation), Yongin, South Korea: Dankook University.
- Kwon, Young-Mo (2015), "A Study on the Affecting the Intention to Use of Smart-Phone Mobile Banking", *Journal of Industrial Economics and Business*, 28(1), 529-549.
- Laukkanen, T. and J. Lauronen (2005), "Consumer Value Creation in Mobile Banking Services", *International Journal of Mobile Communications*, 3(4), 325-338.
- Lederer, A. L., D. J. Maupin, M. P. Sena and Y. Zhuang (2000), "The Technology Acceptance Model and the World Wide Web", *Decision Support Systems*, 29(3), 269-282.
- Lee, Chun-Su, You-Kyung Lee and Seog-Soo Kim (2022), "Leading Advanced Education Innovation Strategies for Local Companies Using IPA Analysis", *Journal of Corporation and Innovation*, 45(1), 53-67.
- Lee, Hee-Sang (2018, July 3), "Woori Bank Vietnam Attempts to Differentiate Itself from Vietnamese Local Banks with 'Digital Finance' Strategy", *INSIDE VINA*. Available from <http://www.insidevina.com/news/articleView.html?idxno=129> (accessed October 25, 2022)

- Lee, Hee-Sang (2022, October 28), “Vietnamese Digital Economy Grows Fastest in Southeast Asia”, *INSIDE VINA*. Available from <http://www.insidevina.com/news/articleView.html?idxno=21825> (accessed November 29, 2022)
- Lee, Hyo-Young (2021), “Evolution and Evaluation of Digital Trade Rules in Regional Trade Agreements in the Asia Pacific Region”, *Korea Trade Review*, 46(4), 39-60.
- Lee, Jang-Rho, Hee-Cheol Moon and Chun-Su Lee (2022), *International Marketing*, Seoul: Hanbit Academy, Inc.
- Lee, Soo-Yeon and Jo-Won Park (2016), “A Study on the Intention of the Use of Mobile Payment Services: Application of the Technology Acceptance Model”, *Korean Management Science Review*, 33(2), 65-74.
- Liao, Z. and M. T. Cheung (2002), “Internet-Based e-Banking and Consumer Attitudes: An Empirical Study”, *Information & Management*, 39(4), 283-295.
- Liu, F., E. Ngai and X. Ju (2019), “Understanding Mobile Health Service Use: An Investigation of Routine and Emergency Use Intentions”, *International Journal of Information Management*, 45, 107-117.
- Luarn, P. and H. H. Lin (2005), “Toward an Understanding of the Behavioral Intention to Use Mobile Banking”, *Computers in Human Behavior*, 21(6), 873-891.
- Mallat, N., M. Rossi and V. K. Tuunainen (2004), “Mobile Banking Services”, *Communications of the ACM*, 47(5), 42-46.
- Marques, A., T. Oliveira, S. S. Dias and M. F. O. Martins (2011), “Medical Records System Adoption in European Hospitals”, *The Electronic Journal Information Systems Evaluation*, 14(1), 89-99.
- Martins, C., T. Oliveira and A. Popovič (2014), “Understanding the Internet Banking Adoption: A Unified Theory of Acceptance and Use of Technology and Perceived Risk Application”, *International Journal of Information Management*, 34(1), 1-13.
- Oliveira, T., M. A. Thomas and M. Espadanal (2014), “Assessing the Determinants of Cloud Computing Adoption: An Analysis of the Manufacturing and Services Sectors”, *Information & Management*, 51(5), 497-510.
- Park, Chae-Jin and Doo-Jin Ryu (2018), “Internet-only Banks: An Introductory Overview”, *Korean Management Review*, 47(3), 549-576.
- Pietro, L. D., R. G. Mugion, G. Mattia, M. F. Renzi and M. Toni (2015), “The Integrated Model on Mobile Payment Acceptance (IMMPA): An Empirical Application to Public Transport”, *Transportation Research Part C: Emerging Technologies*, 56, 463-479.
- Shinhan Bank (2022), *Business Report in 2021*. Available from [http://www.shinhangroup.com/kr/invest/filing/business\\_report02.jsp](http://www.shinhangroup.com/kr/invest/filing/business_report02.jsp) (accessed November 25, 2022)
- Sohn, Seong-Min, Boo-Yun Cho, Yeon-Sil Kang and Seong-Pil Ryu (2020), “IPA Analysis of Government’s SME Support Project: Local Industry Promotion Project”, *Journal of Product Research*, 38(5), 139-146.
- Song, Min-Kyu (2015), “Financial Focus: Current Status and Implications of Domestic Financial Investment Companies’ Overseas Expansion”, *Weekly Financial Brief*, 24(20), 10-11.
- Suh, Mun-Seok and Dong-Ho Kim (2019), “A Study on the Changing Direction of FinTech Service Model based on Big Data”, *The e-Business Studies*, 20(2), 195-213.
- Tan, M. and T. S. H. Teo (2000), “Factors Influencing the Adoption of Internet Banking”, *Journal of the Association for Information Systems*, 1(5), 1-42.
- Tomatzky, L. G. and M. Fleischer (1990), *The Processes of Technological Innovation*, Lexington, MA: Lexington Books.
- Wang, Y. M., Y. S. Wang and Y. F. Yang (2010), “Understanding the Determinants of RFID Adoption in the Manufacturing Industry”, *Technological Forecasting and Social Change*, 77(5), 803-815.
- Woori Bank (2022), *Semi-Annual Report for the First Half of 2022*. Available from [http://www.shinhangroup.com/kr/invest/filing/business\\_report02.jsp](http://www.shinhangroup.com/kr/invest/filing/business_report02.jsp) (accessed November 25,

2022)

- Yoon, Joon-Ho (2022, August 29), “Woori Bank Strengthens Retail Sales in Vietnam... Opened Vinhomes Central Park Office in Ho Chi Minh City”, *INSIDE VINA*. Available from <http://www.insidevina.com/news/articleView.html?idxno=21247> (accessed November 25, 2022)
- Yoon, Kyoung-Soo, Jae-Hoon Cha, So-Hee Park and Sun-Young Kang (2017), “Impact of Population Aging on the Financial Sector”, *BOK Working Paper*, 2017-31, 1-52.
- Yusof, M. M., A. Papazafeiropoulou, R. J. Paul and L. K. Stergioulas (2008), “Investigating Evaluation Frameworks for Health Information Systems”, *International Journal of Medical Informatics*, 77(6), 377-385.