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## Article

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## Understanding Internet-Only Bank Service Adoption: An Integration of the Unified Technology Theory of Acceptance and Innovation Resistance Model

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### A B S T R A C T

**Purpose:** To explain the innovation resistance and consumer acceptance of internet-only bank services, this paper proposes an integrated research model that builds on the Extended Unified Theory of Acceptance and Use of Technology (UTAUT2) and Innovation Resistance Model (IRM). We aim to identify the factors that influence the innovation resistance and consumer acceptance for internet-only bank services.

**Design/methodology/approach:** The performance expectancy, effort expectancy, social influence, facilitating conditions, and hedonic motivation of UTAUT2 and the personal innovativeness and perceived security of IRM were adopted in the model. To this end, 203 online survey responses from non-users of internet-only bank services were collected and analyzed.

**Findings:** We find that performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, personal innovativeness, and perceived security affected innovation resistance that in turn ultimately has a negative influence on the consumer acceptance of internet-only bank services.

**Research limitations/implications:** Our sample consists of a homogenous age group, college students whose age are between 20 and 30 years old. For a more robust test and results and as internet-only banking become wide-spread, a future study should include a diverse age group which properly represents internet-only bank service users.

**Originality/value:** Theoretically, we propose an integrated research model that combines UTAUT2 and IRM. The proposed research model adds variables related to personal innovation and security that could not be explained in UTAUT2. Specifically, this study identifies factors that have significant effect on user acceptance or resistance for internet-only bank services. Thus, we highlight factors that can promote market activation and use intention of internet-only bank services. These are expected to be useful to internet-only bank operators and business model developers.

*Keywords: Internet-only Banks, Extended unified theory of acceptance and use of technology, Innovation resistance model, Innovation resistance, Consumer acceptance*

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## I . Introduction

An internet-only bank (sometimes called a direct bank, pure-play internet bank, internet primary bank, online-only bank, or virtual bank) does not have a physical branch network, and it offers its services remotely via online banking, telephone banking, and mobile applications. Internet-only banks reduce the high cost of maintaining a branch network, and the banking system is perceived to be easy, fast, convenient, and compatible with users' existing lifestyles. These banks provide differentiated financial services using information and communication technology, such as credit risk evaluation based on financial big data analysis, which uses artificial intelligence (AI) techniques.

In the United States and Europe, several internet-only banks have been established since the 1990s, and they have been introduced and operated in Japan and China since the 2000s. In Korea, large IT companies, such as KT Corp. and Kakao Corp., were provided licenses to launch internet-only banks in 2016. KT Corp. established an internet-only bank in April 2017 under the name of K Bank Inc. The bank could attract 250,000 new customers in its first two weeks. Similarly, Kakao Bank, which is Korea's second internet-only bank, was established in January 2017 by Korea Investment Holdings and an internet platform company Kakao Corp. The banking service reached the public in July 2017 and gained considerable attention due to its simplicity and unique and intuitive user interface and user experience. The bank attracted more than 240,000 customers within its first 24 hours of operation. As of July 11, 2019, the mobile app-based lender had achieved more than 10 million customers. Globally, this is the largest customer volume in the industry, excluding China (Park & Ryu, 2018). Korea's internet-only banks should learn the business strategies of their counterparts in the US, Japan, and China, who are more experienced in the industry. Further, they should develop a differentiation strategy from commercial banks by providing AI-based financial-technology services and continuously developing mid-rate loan products using financial big data analysis.

Nevertheless, new technologies and innovations in the financial industry do not always achieve commercial success. In particular, internet-only banks inevitably record long-term losses such as investment in fixed costs in the initial financial system construction and enormous marketing costs for stable customer acquisitions. Many internet-only banks in the US and Japan have become bankrupt and more are still operating under losses. If the customer determines that the financial services provided by the internet-only banks are not superior or differentiated from the existing commercial banks, the utilization and spread rates of the internet-only banks will drop.

More importantly, as new innovations and services emerge, customers often feel rejected and insecure. The convergence of IT and financial services mostly have done away the human-contact based service systems that customers are very familiar with. Specifically, the reasons that they resist IT innovation are the lack of knowledge and ability in IT technology, fear of negative consequences, loss of control, uncertainty, and the collapse of existing habits. Therefore, the success of internet-only bank, an innovation in banking services, crucially hinges on the understanding of customer acceptance of the innovation.

Rogers (1962) developed and proposed Innovation Diffusion Theory (IDT) Theory. IDT seeks to explain how, why, and at what rate new ideas and innovation technology spread. He argues that diffusion is the process by which an innovation is communicated over time among the participants in a social system. The origins of IDT are varied and span multiple disciplines. Although a number of studies have been conducted that applied the IDT in various fields, studies related to innovation resistance are insufficient. Ram (1987) defined innovation resistance as an act of refusing to change in the current state and not accepting innovation by being threatened and pressured by innovation change. A representative theory related to innovation resistance is the innovation resistance model (IRM) proposed by Ram (1987).

However, prior empirical studies on innovation resistance of IT services have been mainly on technology acceptance theories such as TAM (Technology Acceptance

Model) and UTAUT (Unified Theory of Acceptance and Use of Technology). Therefore, in this paper we extend the previous technology acceptance model by proposing a model that combines UTAUT2 an extension of UTAUT2 (Venkatesh et al. 2012) and IRM. Unlike prior studies which have focused on user acceptance of technology, we not only study the user acceptance but also attempt to identify and test the factors that affect users' resistance against an innovative banking services of internet-only banks.

The remainder of this paper is organized as follows. Section 2 reviews the literature and states eight hypotheses. Section 3 describes the methods, sample, and data collection, as well as demographic information about the respondents. Then the measurement reliability, correlation between constructs, and the results of the Partial Least Squares (PLS) are shown in Section 4. Finally, the conclusions and implications are presented in Section 5.

## II. Theoretical Background and Hypotheses

### A. UTAUT2 and innovation resistance

This research investigates the determinant factors of innovation resistance by drawing variables from a technology acceptance model of UTAUT2 (Venkatesh et al. 2012). Originally UTAUT developed by Venkatesh et al. (2003) is an extended technology acceptance model (TAM) that combines theory of reasoned action (TRA), motivational model (MM), theory of planned behavior, model of personal computer use, innovation diffusion theory (IDT), and social cognitive theory. UTAUT is a more advanced model proposed to solve the problem of TAM in describing new technology and service acceptance. The model is designed to enhance the understanding of acceptance and use under organizational contexts. UTAUT2 extends UTAUT by adding the concept of hedonic value, price value, and habit. UTAUT2 is a model for improving the predictability of acceptance and use

of technologies and services in a general consumer use context (Yang, 2013; Yuan et al., 2015). The main variables of UTAUT2 are performance expectancy, effort expectancy, social influence, facilitating conditions, and hedonic motivation. These factors determine the acceptance intention and user behavior of innovation services.

Performance expectation refers to the belief that using new information technologies and services will improve work performance. It is a variable inferred from the perceived usefulness of TAM, extrinsic motivation, job-fit, relative advantage, and outcome expectation (Venkatesh & Davis, 2000). Performance expectation is defined as the extent to which using internet-only bank services will aid a customer in performing certain activities.

Effort expectancy is defined as the degree of ease related to a customer's use of a technology. It is essentially the same concept as TAM's perceived ease of use and complexity (Venkatesh & Davis, 2000). If internet-only bank services are perceived as more convenient than existing off-line banking transactions, the intention of accepting them will increase.

Social influence is defined as the degree to which an individual perceives the importance of others' opinions in believing they should use the new system (Park & Chen, 2007). It is a concept in which subjective norms are expanded based on TRA. Social influence means that users themselves tend to follow the opinions of their neighbors when the neighbors consider their internet-only bank services important.

Facilitation conditions refer to the degree of belief that individuals can receive guidance, training, and support services for their technical infrastructure in using new technologies and services. These are variables inferred from perceived behavioral control, facilitating conditions, and compatibility (Taiwo & Downe, 2013). The terms of facilitation conditions refer to the degree to which an individual believes that there is a technical or organizational base that supports the use of internet-only bank services.

Hedonic motivation refers to the degree of fun and enjoyment that users perceive when they use new technologies and services (Alwahaishi & Snašel,

2012; Zhou, 2011). Venkatesh et al. (2012) defined hedonic motivation as fun or pleasure derived from using a technology. Hedonic motivation refers to the level of enjoyment and fun one experiences when using internet-only bank services.

Ram (1987) proposed an IRM that consists of three factors: innovation characteristics, consumer characteristics, and facilitating characteristics based on Sheth's (1981) concept of innovation resistance. The innovation characteristics of IRM represent the technical characteristics of the innovative product and consist of relative advantages, complexity, compatibility, innovation expectations, and perceived risk (Agarwal & Prasad, 1997; Dunphy & Herbig, 1995; Laukkanen et al., 2007). Ram (1987) suggests variables of relative advantage, compatibility, complexity, testability, observability, and perceived risk as factors of IRM. The main variables of IRM and the independent variables of UTAUT2 (performance expectancy, effort expectancy, social influence, facilitating conditions, and hedonic motivation) are very similar. Therefore, this paper proposes the main variables of UTAUT2 as influence factors of innovation resistance.

**Hypothesis 1:** Performance expectancy will have a negative effect on innovation resistance to internet-only bank services.

**Hypothesis 2:** Effort expectancy will have a negative effect on innovation resistance to internet-only bank services.

**Hypothesis 3:** Social influence will have a negative effect on innovation resistance to internet-only bank services.

**Hypothesis 4:** Facilitating conditions will have a negative effect on innovation resistance to internet-only bank services.

**Hypothesis 5:** Hedonic motivation will have a negative effect on innovation resistance to internet-only bank services.

## B. Perceived Innovation Characteristics of IRM and Innovation Resistance

Personal innovativeness means that an individual

can rapidly accept new technologies and services. It is a key psychological characteristic of IDT. Personal innovativeness is defined as the degree to which individuals adopt innovation relatively rapidly compared with other members of society (Agarwal & Prasad, 1998). Financial services are important to consumers' choices and therefore require variables related to willingness. Personal innovativeness is a willingness to use new IT services, and the more innovative the users, the more willing they would be to accept internet-only bank services. Parveen and Sulaiman (2008) developed an extended technology acceptance model that demonstrated that personal innovativeness negatively influences innovation resistance to wireless internet in mobile device technology. Ifinedo (2012) asserts that personal innovativeness and perceived self-efficacy positively influence information systems security policy and behavioral compliance intentions of employees. Hence, the following hypothesis is proposed.

**Hypothesis 6:** Personal innovativeness will have a negative effect on innovation resistance to internet-only bank services.

Financial services face security problems such as customer information leakage, hacking, and privacy infringement. Financial consumers first recognize the economic utility value that can be gained through investments in financial products and asset management services. They use these financial services when the expected benefits are large; however, they opt out when they recognize high security risk. Therefore, we consider the perceived security, which is a major factor in the theory of perceived risk, as a factor in determining innovation resistance. Lu et al. (2005) argue that perceived severity and perceived security will have a positive effect on consumers' resistance to wireless internet services. Based on past research (Cherry & Fraedrich, 2002) and empirical results, perceived security is hypothesized to have a positive effect on innovation resistance to internet-only bank services.

**Hypothesis 7:** Perceived security will have a positive effect on innovation resistance to internet-only bank services.

### C. Innovation Resistance and Consumer Acceptance

Innovative resistance refers to behavioral attitude such as thoughts and intentions about how individuals respond to innovation. According to Ram (1987), innovation resistance is an act of rejecting change in its current state or under the threat and pressure of innovation change. Leonard et al. (2004) noted that innovation resistance has been called a critical success factor for the adoption of technological innovation, and adoption has been portrayed as the result of overcoming resistance. Consumer resistance plays an important role in the success of innovation, as it can inhibit or delay adoption. It has been identified as a major cause of the market failure of innovations (Ram, 1989; Ram & Sheth, 1989) and as a source of information vital to the successful implementation and marketing of innovation. If resistance cannot be broken down, adoption slows and innovation is unlikely. Liang and Xue (2010) argue that users with a stronger resistance motivation are more likely to engage in innovation acceptance of personal computer use. Further, Eo et al. (2016) found the perception of innovation resistance to internet primary banks

will negatively influence the use intention of internet primary banks. Bovey and Hede (2001) argue that the more positively accepted the innovation, the lower the resistance to innovation. Chang and Park (2011) found that the innovation resistance of micro-blog services has a negative effect on acceptance intention. Suh et al. (2009) further argued that resistance to digital convergence products has led consumers to continue using existing products or rejecting innovative products. Therefore, this paper proposes the following hypothesis:

**Hypothesis 8:** Innovation resistance will have a negative effect on the consumer acceptance of internet-only bank services.

### D. Research Model

Following our research problem, purpose, and the formulated hypotheses, we constructed a theoretical model to express the hypothesized relationship between the determinant factors of UTAUT2 and IRM. This paper proposes eight hypotheses, and the research model is displayed in Figure 1. The seven antecedents of the research model in this study are

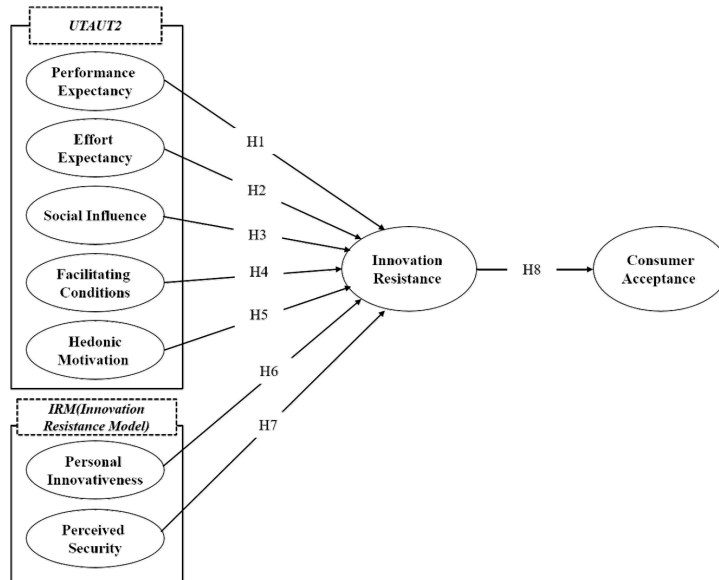


Figure 1. Research Model

performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, personal innovativeness, and perceived security. The consequent is consumer acceptance and the full mediator is innovation resistance.

### III. Data Collection and Sample

In this paper, we proposed an integrated research model to analyze the factors that influence the innovation resistance and consumer acceptance of internet-only bank services. Specifically, a questionnaire was constructed by applying the main variables of UTAUT2: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and the main variables of IRM: personal innovativeness and perceived security to internet-only bank services. Table 1 shows the definitions and measurements of the constructs.

An online questionnaire was administered to individuals who are interested in internet-only bank services but had not yet used any, The survey was conducted through an online survey produced using Google Docs for two weeks in December 2019. The questionnaire items were measured on a five-point Likert scale ranging from “Strongly disagree” to “Strongly agree.” Of the responses received from 255 questionnaires, 203 were valid and 52 were invalid, representing an effective response rate of 79.61%. The demographic information of the respondents is summarized in Table 2. As indicated, 115 (56.7%) were men, and 88 (43.3%) were women. The most common age group was 20-30 years (111 respondents, or 54.7%), and the most common educational attainment was a university degree (158 respondents, or 77.8%). Slightly more than 50% of the respondents had more than 5 years of experience in using the internet or mobile technology.

**Table 1.** Definitions and Measurements of the Constructs

Construct	Measure	Source
Performance Expectancy (PEE)	Performance expectation is defined as the extent to which using internet-only bank services will aid a customer in performing certain activities (i.e., perceived usefulness).	Venkatesh & Davis (2000)
Effort Expectancy (EFE)	If internet-only bank services are perceived as more convenient than existing off-line banking transactions, the intention of accepting them will increase (i.e., perceived ease of use and complexity).	Venkatesh & Davis (2000)
Social Influence (SOI)	Financial consumers themselves tend to follow the opinions of their neighbors when the neighbors consider their internet-only bank services important.	Park & Chen, (2007)
Facilitating Conditions (FAC)	The terms of facilitation conditions refer to the degree to which an individual believes that there is a technical or organizational base that supports the use of internet-only bank services.	Taiwo & Downe (2013)
Hedonic Motivation (HEM)	Hedonic motivation refers to the level of enjoyment and fun one experiences when using internet-only bank services.	Zhou (2011)
Personal Innovativeness (PEI)	Personal innovativeness is defined as the degree to which individuals adopt innovation relatively rapidly compared with other members of society.	Agarwal & Prasad (1998)
Perceived Security (PES)	Perceived security is the extent a financial customers believes internet-only banks will be free of risk to conduct banking services.	Lu et al. (2005)
Innovation Resistance (INR)	Innovation resistance is an act of rejecting change in its current state or under the threat and pressure of innovation change.	Ram (1987)
Consumer Acceptance (COA)	Consumer acceptance refers to the acceptance or reuse of internet-only bank services by financial consumers.	Liang & Xue (2010)

**Table 2.** Demographic Characteristics of the Sample ( $N=203$ )

Category	Variable	Frequency	Percent (%)
Gender	Male	115	56.7
	Female	88	43.3
Age range	20-30 years	111	54.7
	31-40 years	59	29.1
	41-50 years	23	11.3
	51 years and above	10	4.9
Educational attainment	Secondary education	22	10.8
	Vocational/technical	10	4.9
	University education	158	77.8
	Missing	15	6.4
Internet or Mobile experience	Less than 1 years	11	5.4
	2 ~ 5 years	44	21.7
	6 ~ 10 years	107	52.7
	10 years and above	33	16.3
	Missing	8	3.9

#### IV. Data Analysis and Results

In this study, IBM SPSS Statistics 25 was used for demographic analysis and PLS was used to construct the structural equation model (SEM). The PLS technique of SEM, which uses a principle-component-based estimation, was used to perform the analysis. We used the SmartPLS 3.2.8 program to verify the research model and hypotheses. Our model employs nine constructs: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, personal innovativeness, perceived security, innovation resistance, and consumer acceptance. Through a flexible interplay between theory and data, the SEM approach brings together theoretical and empirical knowledge to create a better understanding of the real world. In the SEM of this study, we examined two levels of analysis: the measurement and structural models.

##### A. Assessment of the Measurement Model

The measurement model analysis examines the

psychometric properties of the measures for latent variables by testing for composite reliability, discriminant validity, and convergent validity (Chin, 1998). One measure of composite reliability involves examining the loadings of each construct's individual items. With respect to the quality of the measurement model in relation to the sample, the loadings ( $\lambda$ ) of the items of the constructs listed in Table 3 are significant. Cronbach's  $\alpha$  is the other measure of composite reliability. Table 3 indicates that the Cronbach's  $\alpha$  values of the constructs ranged from 0.746 to 0.957. The Cronbach's  $\alpha$  coefficients of all constructs were greater than 0.6, indicating that the measurements in this study exhibited acceptable reliability. It was also important to verify whether the validity of the measurements in this study was acceptable. Hence, we applied Fornell and Larcker's (1981) measure of average variance extracted (AVE) to assess the discriminant validity of the measurements. The AVE measures the amount of variance captured by the construct through its items relative to the amount of variance resulting from the measurement error. To satisfy the requirements for discriminant validity, the square root of a construct's AVE must be greater than the correlation between the construct and other



**Table 3.** Loadings ( $\lambda$ ), Cronbach's  $\alpha$  Coefficients, and AVEs for Constructs

Construct	Items	$\lambda$	Cronbach's $\alpha$	AVE
Performance Expectancy (PEE)	PEE1	0.912	0.945	0.893
	PEE2	0.895		
	PEE3	0.809		
Effort Expectancy (EFE)	EFE1	0.768	0.801	0.699
	EFE2	0.735		
	EFE3	0.851		
Social Influence (SOI)	SOI1	0.710	0.746	0.670
	SOI2	0.778		
	SOI3	0.692		
Facilitating Conditions (FAC)	FAC1	0.800	0.813	0.717
	FAC2	0.753		
	FAC3	0.729		
Hedonic Motivation (HEM)	HEM1	0.796	0.780	0.663
	HEM2	0.714		
	HEM3	0.747		
Personal Innovativeness (PEI)	PEI1	0.839	0.917	0.882
	PEI2	0.793		
	PEI3	0.824		
Perceived Security (PES)	PES1	0.862	0.957	0.902
	PES2	0.944		
	PES3	0.920		
Innovation Resistance (INR)	INR1	0.811	0.885	0.747
	INR2	0.868		
	INR3	0.822		
Consumer Acceptance (COA)	COA1	0.805	0.931	0.875
	COA2	0.938		
	COA3	0.926		

Note: PEE(Performance Expectancy), EFE(Effort Expectancy), SOI(Social Influence)  
 FAC(Facilitating Conditions), HEM(Hedonic Motivation), PEI(Personal Innovativeness)  
 PES(Perceived Security), INR(Innovation Resistance), COA(Consumer Acceptance)

constructs in the model. The correlation matrix, with correlations among constructs and the square root of AVE on the diagonal, is listed in Table 4. In all cases, the AVE for each construct is larger than the correlation of that construct with all other constructs in the model. Therefore, the discriminate validity of the measurements in this study was acceptable. Additionally, if the AVE of a construct is greater than 0.5, it means that it exhibits convergent validity. As summarized in Table 3, the AVE for each construct ranged from 0.663 to 0.902, indicating that there

was convergent validity in this study. Therefore, adequate reliability and validity are established in this study.

### B. The Results of the Structural Model

The results of the structural model are summarized in Table 5. All eight estimated paths are significant. Performance and effort expectancy are observed to have a negative effect on innovation resistance to

**Table 4.** Correlations Latent Variables

Constructs	1	2	3	4	5	6	7	8	9
PEE	<b>0.945</b>								
EFE	0.469	<b>0.836</b>							
SOI	0.320	0.266	<b>0.819</b>						
FAC	0.451	0.436	0.269	<b>0.847</b>					
HEM	0.332	0.320	0.343	0.214	<b>0.814</b>				
PEI	0.341	0.370	0.276	0.316	0.270	<b>0.939</b>			
PES	-0.465	-0.386	-0.484	-0.358	-0.390	-0.493	<b>0.950</b>		
INR	-0.552	-0.409	-0.523	-0.430	-0.366	-0.255	-0.310	<b>0.864</b>	
COA	0.376	0.244	0.383	0.428	0.341	0.254	0.370	0.507	<b>0.935</b>

Notes: Diagonal elements are the square root of AVE.

PEE(Performance Expectancy), EFE(Effort Expectancy), SOI(Social Influence)

FAC(Facilitating Conditions), HEM(Hedonic Motivation), PEI(Personal Innovativeness)

PES(Perceived Security), INR(Innovation Resistance), COA(Consumer Acceptance)

**Table 5.** Results of Structural Model Analysis

Hypothesized path	Path coefficients	t-value	Results
Performance Expectancy → Innovation Resistance (H1)	-0.326***	-4.073	Supported
Effort Expectancy → Innovation Resistance (H2)	-0.296***	-3.498	Supported
Social Influence → Innovation Resistance (H3)	-0.151**	-2.503	Supported
Facilitating Conditions → Innovation Resistance (H4)	-0.245***	-3.068	Supported
Hedonic Motivation → Innovation Resistance (H5)	-0.189***	-2.992	Supported
Personal Innovativeness → Innovation Resistance (H6)	-0.415***	6.966	Supported
Perceived Security → Innovation Resistance (H7)	0.350***	4.960	Supported
Innovation Resistance → Consumer Acceptance (H8)	-0.497***	-9.859	Supported

Notes: \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

internet-only bank services, thus supporting Hypotheses 1 and 2. Social influence, facilitating conditions, and hedonic motivation are also observed to have a negative effect on innovation resistance to internet-only bank services, thus supporting Hypotheses 3, 4 and 5. Therefore, the key variables of UTAUT2 were found to have a negative effect on innovation resistance to internet-only bank services.

Hypothesis 6 stated that personal innovativeness would have a negative effect on innovation resistance to internet-only bank services. Perceived security is also observed to have a positive effect on innovation resistance to internet-only bank services, thus supporting Hypothesis 7. This result is consistent with those of previous studies asserting that perceived innovation characteristics and perceived security of IRM have

a significant influence on innovation resistance. Innovation resistance is observed to have a negative effect on the consumer acceptance of internet-only bank services, thus supporting Hypothesis 8. This result is consistent with that of IRM, thus asserting that innovation resistance has a negative effect on consumer acceptance.

## V. Discussion and Conclusion

Prior studies on internet-only banks have focused on the technology acceptance factor. In contrast, this study suggested the innovation resistance factors of

adopting internet-only bank services based on UTAUT2 and IRM. We proposed an integrated research model that integrates the key variables (performance expectancy, effort expectancy, social influence, facilitating conditions, and hedonic motivation) of UTAUT2 and IRM (personal innovativeness and perceived security). We tested a research model using 203 online survey responses from the non-users of internet-only bank services. The data analyses revealed some major findings. First, performance expectancy and effort expectancy negatively influence innovation resistance to internet-only bank services. Social influence, facilitating conditions, and hedonic motivation also negatively influence innovation resistance to internet-only bank services. Therefore, the key variables of UTAUT2 were found to have a negative effect on innovation resistance of internet-only bank services. As antecedence factors of innovation resistance, they correlated with the main variables of UTAUT2. Second, personal innovativeness has a negative effect on innovation resistance to internet-only bank services. Perceived security also has a positive effect on innovation resistance to internet-only bank services. This result is consistent with those of previous studies asserting that perceived innovation characteristics and perceived security of the IRM have a significant influence on innovation resistance. Ram (1987) suggested innovation characteristics, consumer characteristics, and facilitating characteristics as determinant factors of innovation resistance, which are similar to those of UTAUT2. Finally, innovation resistance has a negative effect on consumer acceptance of internet-only bank services. This result is consistent with that of IRM, thus asserting that innovation resistance has a negative effect on consumer acceptance. Therefore, the determinant factors of UTAUT2 and IRM significantly contribute to innovation resistance, which has a negative influence on the consumer acceptance of internet-only bank services.

The contributions of this study are as follows. Theoretically, an integrated research model that combines UTAUT2 and IRM, which are the most advanced models for information technology acceptance, is proposed in this paper. The proposed research model adds variables related to personal innovation and

security that could not be explained in UTAUT2. This study derives the deactivating factors of innovation services by considering innovation and consumer characteristics affecting innovation resistance. Further, this study practically suggests factors of internet-only bank services, which are in the early stages that have a significant effect on user acceptance or resistance. Based on the results of this study, we highlighted factors that can promote market activation and use intention of internet-only bank services. These are expected to be useful to internet-only bank operators and business model developers.

This study has several limitations. First, we analyzed responses from only non-users and discontinued users of internet-only bank services. As internet-only banks mature, it is necessary to understand changes in users' behavior and conduct comparative analysis with overseas banks. Second, the survey showed that respondents were mostly university students in their twenties (20-30 years), whereas elderly respondents were few. This is a problem with generalization. Future studies will need to collect broad and diverse samples. Finally, in a future research, we will conduct the Delphi survey and employ in-depth interview methods to identify the resistance factors of the internet-only bank market activation and elucidate the technical and institutional factors required to stimulate internet-only bank services.

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## References

- Agarwal, R., & Prasad, J. (1997). The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. *Decision Sciences*, 28(3),

557-582.

- Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information System Research*, 9(2), 204-215.
- Alwahaishi, S., & Snášel, V. (2012). Consumers' acceptance and use of information and communications technology: A UTAUT and flow based theoretical model. *Journal of Technology Management & Innovation*, 8(2), 61-73.
- Bovey, W. H., & Hede, A. (2001). Resistance to organizational change: The role of cognitive and affective processes. *Leadership and Organization Development*, 22(8), 372-382.
- Chang, Y. H., & Park, J. G. (2011). Factors affecting microblog adoption and innovation resistance on microblog. *Entrue Journal of Information Technology*, 10(1), 41-52.
- Cherry, J., & Fraedrich, J. (2002). Perceived risk, moral philosophy and marketing ethics: Mediating influences on sales managers' ethical decision-making. *Journal of Business Research*, 55(12), 951-962.
- Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. *MIS Quarterly*, 22(1), 12-16.
- Dunphy, S., & Herbig, P. A. (1995). Acceptance of innovations: The customer is the key!. *Journal of High Technology Management Research*, 6(11), 193-209.
- EO, Y. J., Hwang, M. S., Kwon, M. C., & Han, K. S. (2016). A study on innovation resistance model of internet primary banks. *International Journal of Software Engineering and Its Applications*, 10(6), 1-12.
- Fomell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Ifinedo, P. (2012). Understanding information systems security policy compliance: An integration of the theory of planned behavior and the protection motivation theory. *Computers & Security*, 31(1), 83-95.
- Laukkanen, T., Sinkkonen, S., Kivijärvi, M., & Laukkanen, P. (2007). Innovation resistance among mature consumers. *Journal of Consumer Marketing*, 24(7), 419-427.
- Leonard, L. N. K., Cronan, T. P., & Kreie, J. (2004). What influences IT ethical behavior intentions-planned behavior, reasoned action, perceived importance, or individual characteristics?. *Information and Management*, 42(1), 143-159.
- Liang, H., & Xue, Y. (2010). Understanding security behaviors in personal computer usage: A threat avoidance perspective. *Journal of the Association for Information Systems*, 11(7), 393-413.
- Lu, J., Yao, J., & Yu, C. (2005). Personal innovativeness, social influences, and adoption of wireless internet services via mobile technology. *Strategic Information Systems*, 14(3), 245-268.
- Park, Y., & Chen, J. V. (2007). Acceptance and adoption of the innovative use of mobile phone. *Industrial Management and Data Systems*, 107(4), 1349-1365.
- Park, C., & Ryu, D. (2018). Interent-only banks: An introductory overview. *Korean Management Review*, 47(3), 549-576.
- Parveen, F., & Sulaiman, A. (2008). Technology complexity, personal innovativeness and intention to use wireless internet using mobile devices in malaysia. *International Review of Business Research Papers*, 4(5), 1-10.
- Ram, S. (1987). A model of innovation resistance. *Advances in Consumer Research*, 14(1), 208-212.
- Ram, S. (1989). Successful innovation using strategies to reduce consumer resistance: An empirical test. *Journal of Product Innovation Management*, 6(1), 20-34.
- Ram, S., & Sheth, N. J. (1989). Consumer resistance to innovation: The marketing problem and its solution. *Journal of Consumer Marketing*, 6(2), 5-14.
- Rogers, E. M. (1962). *Diffusion of innovations* (1st ed.). New York: Free Press.
- Sheth, J. N. (1981). Psychology of innovation resistance: The less developed concept (LDC) in diffusion research. *Research in Marketing*, 4, 273-282.
- Suh, M., Ahn, J., Lee, E., & Oh, D. (2009). Purchasing avoidance of digital convergence products: Focusing on the customer's psychological factors and the innovation resistance. *The Korea Contents Society*, 9(1), 270-284.
- Taiwo, A. A., & Downe, A. G. (2013). The theory of user acceptance and use of technology(UTAUT): A meta-analytic review of empirical findings. *Journal of Theoretical & Applied Information Technology*, 49(1), 48-58.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186-204.
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425-478.
- Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 175-178.
- Yang, S. (2013). Understanding undergraduate students' adoption of mobile learning model: A perspective of the extended UTAUT2. *Journal of convergence information technology*, 8(10), 969-979.
- Yuan, S., Ma, W., Kanthawala, S., & Peng, W. (2015). Keep using my health apps: Discover users' perception of health and fitness apps with the UTAUT2 model. *Telemedicine and e-Health*, 21(9), 735-741.
- Zhou, T. (2011). Understanding mobile Internet continuance usage from the perspectives of UTAUT and flow. *Information Development*, 27(3), 207-218.