Examining Customers' Intention of Continued Use and Cross-Buying on Internet-Only Banks

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A B S T R A C T

Internet-only banks (IOB) refer to financial institutions which provide services entirely through online digital platforms without physical branches. Although IOBs have been around for over 26 years, there is still room for investigating what factors motivate customers to use them continuously and extensively. Therefore, this study aims to examine what factors lead to customers' intention of continued use and cross-buying on IOBs by extending the Post-Acceptance Model of IS Continuance (PAMISC). The result shows that perceived economic benefit and ongoing trust have significant relationships with the intention of continued use and that ongoing trust has significant direct and mediating (via intention of continued use) relationships with the intention of cross-buying. Also, personal innovativeness positively moderates the relationship between ongoing trust and the intention of cross-buying. This study sheds light on the literature on branchless financial services and PAMISC. IOB practitioners should revisit the effectiveness of customers' economic benefits to establish ongoing trust with customers.

Keywords: Internet-only Banks (IOB), Post-Acceptance Model of IS Continuance, Cross-Buying, Trust, and Personal Innovativeness

Ⅰ. Introduction

Internet-only banks refer to financial institutions which provide services entirely through online digital platforms without physical branches (Yoon and Lim, 2020). It is also known as a "virtual bank", "direct bank", "branchless bank" and "forward bank". It provides services by using different technology-enabled channels including phone banking, mobile banking, online banking, and automated teller machines without any physical branches or rarely with some exceptions that there are a few physical customer centers

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launched (Yoon and Lim, 2021). This study uses the term "Internet-only banks" (IOB, hereinafter) to represent this type of bank.

The first IOB, Security First Network Bank, was established in the US in 1995 (Lee and Kim, 2020). Afterward, IOBs have been actively operating in Europe, Japan, China, Canada, and the US, and continue to be established around the world (Yoon and Lim, 2020). Based on the report published by the Bank for International Settlements in Jan 2022 (Chen et al., 2022), the percentage of weekly active users in Korea increased from around 6% in 2018 to around 13% in 2021; that of Japan increased from 6% in 2018 to 12% in 2021; that of India even increases from 1.5% in 2018 to 17% in 2021. In 2022, 27% of banking customers in the US use IOBs (Effler and Roderick, 2022). These figures show that the adoption of IOBs around the world is drastically increasing. The rise of the IOB penetration rate until the 2010s can be explained by the wide adoption of mobile devices (Kaabachi et al., 2017).

Without the cost of running physical branches, IOBs could have the financial capability to charge zero (if not very low) transaction fees, offer higher interest rates for customers' deposits and provide lending at a lower interest rate than those of traditional banks to attract customers (Lee and Kim, 2020). IOBs have been widely adopted in different countries, so they are believed to pose significant threats to traditional banks. As per the IBM report released in August 2019, IOBs cause disruptive changes to the Asian financial service sector, so traditional banks are suggested to leverage their customer bases, resources, and reputations to increase their competitive advantage (Wagle and Biswas, 2019). To address the disruptive threats of IOBs,

some traditional banks have tried to make the best use of the rise of IOBs. It is worth mentioning that many IOBs are affiliated companies with traditional large financial institutions. For example, Tangerine Bank in Canada is owned by Scotiabank; Mox Bank in Hong Kong is partially owned by Standard Chartered Bank; AIBank in China is partially owned by China CITIC Bank. Apart from traditional banks, big technology or fintech firms are some of the largest shareholders of IOBs in Asia (Zhang et al., 2018). These firms formed a partnership with financial institutions to form IOBs. For example, Kakao Bank is partially owned by both Kakao, a South Korean Internet company, and Korea Investment Value Asset Management; AIBank in China is owned by both Baidu, a Chinese big technology company, and China CITIC Bank. As such, IOBs are playing more important roles in the financial service and IT industries. The significant growth in the penetration presented in the previous paragraph and its importance for the various industries highlight the importance of the research topic of the present study.

Although IOBs are recently gaining some interest from academia with about a dozen of recently published empirical papers on users' adoption and continuance, there is still room for investigating what factors motivate customers to use this type of financial service continuously and 'extensively' (i.e., 'extensive' usage means that customers use multiple services offered by a service provider.). Extant studies of IOBs mostly examined the influencing factors of initial adoption while little empirical effort has been made to examine the intention of continued use or cross-buying. *Cross-buying* is defined as the customers' propensity to make cross-category purchases (Estrella-Ramon et al., 2016). It is an extension of the relationship with customers rather than merely retaining their intention to purchase (Liu and Wu, 2007). Nowadays, it is common for banks to cross-sell

different banking, insurance, and investment products, e.g., "bancassurance" is to cross-sell insurance products to bank customers (Hong and Lee, 2012). Dandapani and Lawrence (2008) pointed out that the past failure of IOBs is due to high non-interest expenses which refer to operating costs of running a bank, e.g., IT expenses, legal and administration expenses, marketing expenses, etc., (CFI Team, 2020). Many IOBs provide some types of monetary welcome rewards to attract first-time users, which have helped them attract initial customers but at the same time greatly increased their operating costs. If those IOB service providers do not know what factors lead to their existing or newly acquired customers' continued use or cross-buying intention, it is difficult for them to retain the customers who had been attracted by the welcome rewards. Together with heavy technology-related costs, IOBs face difficulties in sustaining themselves or making profits. As such, understanding the influencing factors for current customers' continued use and cross-buying intentions is important to the survival of IOBs. In other words, if attracting customers' continuance intention to use is a way for IOBs to survive, inducing customers' cross-buying intention is essential for IOBs to expand. Therefore, the purpose of this study is to examine *what factors lead to customers' cross-buying on IOBs by extending the Post-Acceptance Model of IS Continuance (PAMISC)* (Bhattacherjee, 2001b).

The findings of this study can contribute to the theory of PAMISC and the literature on cross-buying and technology-enabled financial services, as it extends the PAMISC with the concept of cross-buying in the context of the tech-enabled financial services (IOB). The current study also provides the practitioners in IOBs with some pieces of advice on what they can do to induce their customers' intention of continued use and cross-buying. This study begins with the similarities and differences between 'IOBs' and 'online and mobile banking services provided by traditional banks', which are considered similar to IOBs and studied widely in the last 2 decades. Then, it reviews the literature on the studies on the adoption of IOBs; continuance intention to use online and mobile banking; the cross-buying intention of financial services. After that, it proposes a research model on the influencing factors for current IOB customers' continuance and cross-buying intentions and empirically validates the proposed research model, followed by discussions and future research suggestions.

Ⅱ. Literature Review and Theoretical Background

2.1. Similarities and Differences between IOBs and Online Banking Services by Traditional Banks

Some people may treat IOBs the same as online banking. The term, online banking, is originated from the fact that traditional brick-and-mortar banks prepared a web-based channel to serve their customers on top of physical banking services. It can be considered a combination of conventional banking and web technology, being increasingly developed by worldwide banking sectors (Sikdar et al., 2015). As such, it is a complementary channel for existing brick-and-mortar branches of conventional banking (Lee and Kim, 2020). It enables customers to access their bank accounts, pay bills, request credit cards, and fulfill other banking needs through their laptops or mobile devices from anywhere at any time (Shaikh and Karjaluoto, 2015). Online banking has offered customers access to financial services without visiting

branches and helped financial institutions save on rental and labor costs (Zhang et al., 2018). However, online banking cannot exist without branches because some of the functions (e.g., account opening, lending, etc.) are available in branches only.

On the contrary, IOBs provide all the services without branches, which can help the service providers save branch operating costs and significantly reduce the burden of hiring staff. In fact, IOBs may integrate all the above-mentioned technology-enabled banking channels, including the Internet, mobile, automated teller machines, and call centers to provide financial services through non-face-to-face authentication (Yoon and Lim, 2021). Moreover, the mobile applications of IOBs greatly enhance convenience for consumers in a way that they provide a choice for customers to use biometric authentication, such as fingerprints or face, to open an account or apply for a loan without visiting a branch (Lee and Kim, 2020). Another difference is that IOBs often provide customers with higher interest rates for their savings; lower interest rates for lending products and more attractive welcome rewards than traditional banks (Yoon and Lim, 2020). In sum, IOB should be considered a financial institution while online banking is only a customer-serving channel established by traditional banks on top of face-to-face interactions, phone banking, and ATMs.

2.2. Studies on the Initial Adoption of IOB

In this study, we defined 'adoption' as the initial use of IOB at an individual level (Sharman and Mishra, 2014). So far, there are not many studies that specifically focus on the ongoing adoption of IOBs. Seven studies that investigated the intention to adopt IOB services were reviewed and four categories of factors leading to the initial adoption of IOBs

were identified; (1) System-related factors; (2) overall benefits; (3) user's personal traits; (4) social factors. These factors help us identify key factors that can be related to the ongoing adoption of IOB services. <Table 1> summarizes the influencing factors in each category.

First, regarding system-related factors, system quality, information quality and service quality are three aspects to measure the quality of IOB applications (Yoon and Lim, 2021). These three aspects are derived from the updated DeLone and McLean's Information Systems Success Model (DeLone and McLean, 2003). System quality measures response time, ease of use, system reliability, and security. Information quality measures relevance, usefulness, up-to-date information, and ease of understanding. Service quality measures the responsiveness, assurance, and reliability of information system providers.

We can see that reliability applies to both system and service quality. Kaabachi et al. (2017) defined it as structural assurance, i.e., how the users believe that contextual conditions such as promises, contracts, regulations, and guarantees are in place. In the financial service context, reliability is directly related to customers' trust (Llewellyn, 2005). That is, without a certain level of trust in the service, customers might not take the risk of using IOBs, because customers have to provide IOBs with their personal and financial information before they receive the actual services and returns from IOBs. In general, trust is defined as the extent to which one party is willing to be vulnerable to another party to perform a specific task toward the expected and promised level (Dimitriadis and Kyrezis, 2010; Grabner-Kräuter and Kaluscha, 2003; Zhang et al., 2018). In terms of adopting a new technology-enabled financial service, initial trust is found to be a significant factor for first-time users adopting such a

service (Kaabachi et al., 2017; Lee and Kim, 2020; Zhang et al., 2018). Based on these findings, this study proposes that trust in the services will also play an important role in current IOB customers' ongoing use in the following section.

Second, regarding customers' benefits, IOBs can provide both economic and non-economic benefits to customers and service providers. IOBs play an important role in increasing the economic benefit of financial services by reducing the cost of branch operations (Ahn and Lee, 2019; Lee and Kim, 2020; Yoon and Lim, 2021). Due to the no cost of a branch operation, not only do IOBs charge zero (if not, very low) transaction fees for most of their services, but also offer high interest rates for deposits and low interest rates for loans to attract customers. Apart from economic benefits, IOBs also allow customers to access all banking services without time or space constraints (Ahn and Lee, 2019; Kaabachi et al., 2017; Lee and Kim, 2020). Also, Li et al. (2021) found that emotional value, defined as the perceived enjoyment of using IOBs, is important to the adoption of IOBs. Yoon and Lim (2021) identified two factors related to users' benefits; 1) perceived usefulness, which refers to users' perception that a technology-enabled service can help them with their tasks (Davis, 1989), and 2) relative advantage, which measures the degree to that an innovation is perceived as being better than its precursor or substitutes (Rogers, 2003). As such, the economic benefits and convenience have been found to be the relative advantages brought by IOBs which supersede online banking. However, since the pandemic lockdown, many traditional banks have started to provide con-

<Table 1> Factors Affecting the Adoption of IOBs

Categories	Factors Influencing IOB Adoption	Studies
System-related factors	Risks (including security and privacy risks)	Lee and Kim (2020); Li et al. (2021)
	Perceived website quality	Kaabachi et al. (2017); Kaabachi et al. (2019)
	Perceived structural assurance	Kaabachi et al. (2017); Li et al. (2021); Yoon and Lim (2021)
	System quality, Complexity, or Compatibility	Yoon and Lim (2020); Yoon and Lim (2021); Kaabachi et al. (2019)
	Information quality	Yoon and Lim (2021); Kaabachi et al. (2019)
	Service quality	Yoon and Lim (2021)
	Trialability	Yoon and Lim (2020)
Overall benefits	Convenience or perceived usefulness (non-economic)	Ahn and Lee (2019); Lee and Kim (2020); Yoon and Lim (2021)
	Economic efficiency	Ahn and Lee (2019); Lee and Kim (2020); Yoon and Lim (2021)
	Perceived relative advantage	Kaabachi et al. (2017); Li et al. (2021); Yoon and Lim (2020)
	Emotional value	Ahn and Lee (2019)
User's personal traits	Personal innovativeness or interest	Li et al. (2021); Yoon and Lim (2020); Yoon and Lim (2021)
	Computer self-efficacy or familiarity	Kaabachi et al. (2017); Yoon and Lim (2020)
Social factors	Critical mass, image or Peer influence	Lee and Kim (2020); Yoon and Lim (2020); Yoon and Lim (2021)
	Brand trust	Zhang et al. (2018)
	IOB's reputation	Kaabachi et al. (2017)

tactless and paperless services to their customers, so the relative advantages of IOBs in terms of non-economic benefits (i.e., convenience) have been diminished (Asif et al., 2020). Therefore, this study focuses only on users' *perceived economic benefits* from IOBs, which refer to 'users' perceptions of the economic value of using IOBs', as an important factor for the ongoing adoption of IOB in the following section.

Third, as for users' personal traits, personal innovativeness and computer self-efficacy are identified as important factors for the initial adoption of IOB (Yoon and Lim, 2020, 2021). Personal innovativeness is defined as the degree to which an individual is willing to adopt a new idea earlier than other people (Rogers, 2003). Yoon and Lim (2020) find that users with higher personal innovativeness will perceive more usefulness of the technology and enjoyment from the use, thus having more intention to use IOBs. Second, computer self-efficacy is defined as a person's belief in his or her capability to perform a given task (Compeau and Higgins, 1995). The users who have higher computer self-efficiency are less afraid of using new technologies to achieve their expected goals, so they tend to enjoy and perceive IOBs as useful. Kaabachi et al. (2017) also posit that users who are more familiar with online banking tend to have higher initial trust towards IOBs because they will have more confidence in their capabilities to use IOB applications. Based on Montazemi and Qahri-Saremi (2015)'s literature review on online banking, personal innovativeness is rarely studied in the post-adoption stage, but we believe that innovativeness will play an important role for an existing IOB user to continue using the IOB services and expend the service offerings. Therefore, this study proposes to study the importance of *personal innovativeness* rather than computer self-efficacy for

the ongoing adoption of IOB in the following section.

Finally, for social factors, perceived critical mass refers to the degree to which an individual perceives that most peers are using the same system (Van Slyke et al., 2007). Critical mass is a social factor for IOB adoption because when more people use the services, knowledge, and information can be easily shared, making it easier to improve service quality (Lee and Kim, 2020). When more people use IOBs, the reputation of IOBs increases and thus raises non-users' initial trust towards IOBs (Kaabachi et al., 2017). In addition, as mentioned, Zhang et al., (2018) posit that potential users' trust in the brand of technology companies that developed the IOB applications might form their initial trust towards IOBs, which can influence initial adoption.

Taken together, the literature review on the initial adoption of IOB helps find relevant factors for the ongoing adoption of IOB; *trust, perceived economic benefits*, and *personal innovativeness*, which will be further elaborated on in the following section.

2.3. Studies on the Continuance Intention to Use Online Banking Services

While the former section only focuses on the factors leading to the initial adoption of IOBs, this section focuses on the factors of continuance intention to use. As mentioned, due to the scarcity of extant studies that specifically investigated 'the ongoing adoption of IOBs' (Lee and Kim, 2020), this section reviews studies on the continued use of online and mobile banking services (i.e., including those provided by branch-based traditional banks), in order to gain more insight about what factors might lead to continued use of IOBs, focusing on the difference in the role of identified factors between pre(initial)-adoption and post-adoption stages. <Table 2>
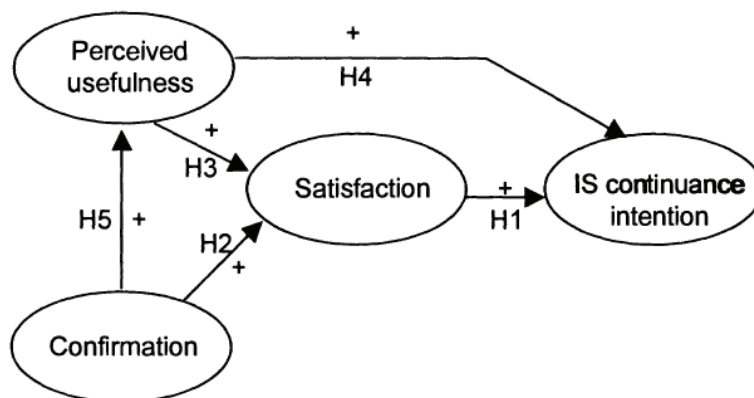
summarizes the influencing factors of continuance intention to use online banking services.

Similar to those identified for the initial adoption of IOBs, system-related factors of online banking, user's personal traits and social factors are identified as influencing factors for continuance intention to use online banking services. However, the definition and significance of the influencing factors under each category are different between those for pre-adoption and post-adoption. Montazemi and Qahri-Saremi (2015) found that the significance of system quality, information quality, and service quality in the post-adoption of online banking is different from that of pre-adoption. The reason is that after adoption, these factors are based on users' direct experience with the online banking system (Montazemi and Qahri-Saremi, 2015).

Unlike the case of the initial adoption of IOBs (or online/mobile-banking services), confirmation is the most studied variable of continuance intention to use online banking. Many studies find that confirmation is an important variable of continuance intention to use online banking (Chen and Li, 2017; Eriksson and Nilsson, 2007; Foroughi et al., 2019; Hoehle et al., 2012; Lin, 2011; Poromatikul et al., 2020; Susanto et al., 2016; Vedadi and Warkentin,

2016; Yuan et al., 2019). *Confirmation* is defined as a cognitive belief based on the extent to which users' expectation of IS use is realized during actual use (Bhattacherjee, 2001b). It can be formed or enhanced when the performance after the usage is greater than or equal to the prior expectation from a service, resulting from a user's post-use evaluation of her/his use experience of a technology-enabled service (Bhattacherjee, 2001b; Lin, 2011). The Post-Adoption Model of Information System Continuance (PAMISC) posits that confirmation is the key concept that forms IS users' beliefs, affect, and behavioral intention after their initial use (Bhattacherjee, 2001b) (<Figure 1>). The next section will explain how the PAMISC can be modified to fit the context of IOB, while confirmation will be kept as a key variable for the proposed research model.

Another difference in the role of identified factors between pre(initial)-adoption and post-adoption stages is that trust can play a more significant role in continuance intention to use than in initial adoption. Continuance intention is tightly related to customers' loyalty, which refers to a customer's repurchasing behavior because they like a brand or service after continuous use (Kaabachi et al., 2019; Thakur, 2014). Therefore, the type of trust we discuss

<Figure 1> Post-Acceptance Model of IS Continuance (Bhattacherjee, 2001b)

<Table 2> Factors Affecting Trust or Satisfaction with Continued Use of Online Banking

Categories	Factors Influencing the Adoption of Online Banking	Studies
System-related factors	System quality, information quality, service quality, competence, integrity	Chung and Kwon (2009); Kaabachi et al. (2019); Montazemi and Qahri-Saremi (2015); Ofori et al. (2017); Poromatikul et al. (2020); Sharma and Sharma (2019); Shergill and Li (2005); Thakur (2014); Yu et al. (2015); Zhou et al. (2010); Zhou (2013)
	Customization, interactivity or personalization	Kaabachi, et al. (2020); Oertzen and Odekerken-Schröder (2019); Vatanasombut et al. (2008)
	Security and privacy	Chan (2001); Hernandez and Mazzon (2007); Ofori et al. (2017); Shergill and Li (2005); Susanto et al. (2016); Vatanasombut et al. (2008); Zhou et al. (2010); Yu et al. (2015)
	Results demonstrability, trialability	Chan (2001); Hernandez and Mazzon (2007)
	Opportunistic behaviour control, structural assurance	Asnakew (2020); Hernandez and Mazzon (2007); Montazemi and Qahri-Saremi (2015); Ofori et al. (2017); Shergill and Li (2005)
Overall benefits	Perceived usefulness	Asnakew (2020); Chan (2001); Chang, and Ha (2016); Chen and Li (2017); Foroughi et al. (2019); Lin (2011); Hoehle et al. (2012); Montazemi and Qahri-Saremi (2015); Oertzen and Odekerken-Schröder (2019); Susanto et al. (2016); Yuan et al. (2016),
	Compatibility with lifestyle or Perceived task-technology fit	Hernandez and Mazzon (2007); Yuan et al. (2016)
	Convenience, economic benefits, relationship termination cost	Hernandez and Mazzon (2007); Poromatikul et al. (2020); Vatanasombut et al. (2008); Yuan et al., (2019)
	Confirmation or disconfirmation	Chen and Li (2017); Foroughi et al. (2019); Poromatikul et al. (2020); Yuan et al. (2016)
	Perceived ease of use	Asnakew (2020); Chan (2001); Foroughi et al. (2019); Lin (2011); Montazemi and Qahri-Saremi (2015); Yuan et al. (2016)
User's personal traits	Attitude, subjective norm, preference	Asnakew (2020); Chan (2001); Foroughi et al. (2019); Hernandez and Mazzon (2007); Oertzen and Odekerken-Schröder (2019)
	Self-efficacy or anxiety	Han (2001); Foroughi et al. (2019); Hernandez and Mazzon (2007); Susanto et al. (2016); Yuan et al. (2019)
	Calculative commitment, Affective commitment	Yuan et al. (2019)
Social factors	Receiving WOM Image	Oertzen and Odekerken-Schröder (2019); Chan (2001); Hernandez and Mazzon (2007); Poromatikul et al. (2020)
	Quality of alternatives	Yuan et al. (2019)
	Brand reputation or institutional trust, multichannel satisfaction	Asnakew (2020); Chen and Li (2017); Eriksson and Nilsson (2007); Montazemi and Qahri-Saremi (2015); Shergill and Li (2005); Zhou et al. (2010)

here is a continuous or *ongoing trust* which is developed over time as a result of continuous interactions between users and IOBs (Hoehle et al., 2012; Lee and Kim, 2020). *Ongoing trust* plays an important role in online banking continuance because it acts as mental protection against potential risks and unexpected actions associated with an online banking service (Yu et al., 2015). Similar to those factors identified in section 2.2, the factors of *ongoing trust* are mostly about reliability, i.e., users' believe that legal, regulatory, business and technical environments exist to mitigate the chance of any negative outcomes from the use of technology (Chen and Li, 2017; Kaabachi et al., 2019; Ofori et al., 2017; Sharma and Sharma, 2019; Zhou, 2013). After the first usage, if the performance of the information systems fulfills users' expectations (i.e., confirmation), users will be satisfied with the information systems (Bhattacherjee, 2001b). However, what is more important to induce users' continued use is the fact that customers will get to know the traits and characteristics of the service and thus evaluate its trustworthiness, which is an antecedent of customers' ongoing trust leading to the subsequent continuance intention to use (Yu et al., 2015). Based on Social Exchange Theory, if a service is proven trustworthy, users are more likely to believe that the benefit of continuous use of this service is larger than its associated risk (Cook et al., 2013). Therefore, satisfaction measures the degree to which a system can meet users' expectations, while ongoing trust measures customers' expectations of a system's future behavior (Zhou et al., 2010). In other words, ongoing trust can only be formed when users have satisfaction with a system. This study focuses on not only the intention of continued use but also the intention of cross-buying which is mainly related to users' expectations of the financial service's future behav-

iour after purchasing a new product category. Also, we found that financial institutions are dedicated to building customers' loyalty and thus employ many professionals and adopt different marketing and administrative strategies to build a reliable image in a bid to build customers' ongoing trust. Therefore, the research model focuses on ongoing trust rather than satisfaction in the original PAMISC.

2.4. Beyond the Continued Use: Cross-Buying of Financial Services

The term cross-buying entails customers' propensity to make cross-category purchases (Estrella-Ramon et al., 2016). It is a different customer behavior from continued use. From a service provider's perspective, while customers' continued use of a service is about retaining the customers with the same service, customers' cross-buying behavior is an extension of the supplier's relationship with customers (Liu and Wu, 2007). Even if a customer uses a service continuously, s/he will not necessarily cross-buy other services from the same service provider (Liu and Wu, 2007). For example, a customer who opened a savings account on an IOB could continue to use the account but s/he may not necessarily borrow money (i.e., a loan service) from the IOB even if s/he has such a financing need. Similarly, even if another customer quits the savings account, s/he may still cross-buy other services from the same IOB because, for example, s/he had a positive experience with that service provider. Therefore, the intention of 'continued use' and the intention of 'cross-buying' are not the same and should be treated as two separate intentions for usage and purchasing. However, customers with more intention of continued use will have more intention of cross-buying because buyers in the later stages of a relationship with a seller have

more confidence in the evaluations of the seller than in the earlier stage (Verhoef et al., 2001). In other words, customers with repetitive usage of an online platform will perceive that the associated risk of buying a different product from this platform is lower and thus more willing to cross-buy. Therefore, cross-buying intention can be viewed as an extension of the intention of continued use. Since PAMISC is a model explaining the intention of continued use, our research model is to examine the factors leading to the intention of cross-buying by extending PAMISC.
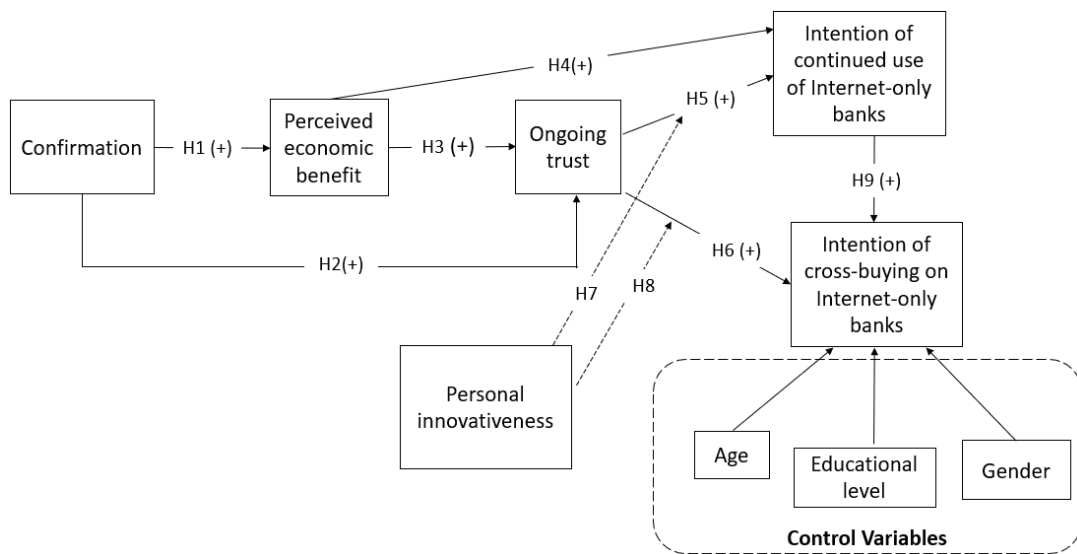
In the IOB literature, although Lee and Kim (2020) investigated the factors leading to both adoption and continuance intention to use IOBs, this study did not show the multi-stage effects of facilitating factors for intention to adopt or continue to use IOBs and also did not make a distinction between the factors influencing initial adoption and those for use continuance. However, Bhattacherjee (2001b) posits that continuance should not be treated as an extension of acceptance behaviours. If we merely extend the factors for users' initial adoption, we cannot explain why some users give up the use of an information system after their initial adoption.

Nowadays, it is common for banks to cross-sell different banking, insurance, loan, and investment products. The services provided by IOBs include checking accounts and savings accounts, credit cards, investments, loans, and insurance products. Current customers of an IOB could have various products or have the intention to cross-buy different types of financial service products in the near future from the same IOB. For example, "bancassurance" is a term to describe cross-selling insurance products to customers of banks (Hong and Lee, 2012). The global Bancassurance market size was valued at USD 24.2 billion in 2022 and is expected to increase drastically

to USD 32.4 billion by 2028 (MarketWatch, 2023). This substantial value brought by bancassurance and its rapid growth rate explains why it is important for financial institutions to understand the factors of cross-buying intention. Indeed, increasing customers' cross-buying intention could be a great way to help IOBs expand their market shares and make a profit. Therefore, this study proposes another dependent variable − *cross-buying intention*, on top of the intention of continued use, in order to extend the PAMSIC in the context of IOB. In this study, the *cross-buying intention* is defined as the customers' propensity to make a cross-category purchase of different financial products from the same IOB (Estrella-Ramon et al., 2016).

Ⅲ. Hypothesis Development

PAMISC (<Figure 1>) explains how cognitive and affective beliefs affect users' intention to continue using information systems (IS) (Bhattacherjee, 2001b). Based on the literature review on both adoption of IOBs and continuance intention to use online and mobile banking, we found that the level of significance and definition of some variables are different between those of initial adoption and those of continued use. Therefore, simply applying the variables of IOB adoption to the model of continued use of IOBs cannot explain why some users give up the use of IOB after their initial adoption. PAMISC is the first model to address the abovementioned difference in the factors influencing initial adoption and use continuance and has been used for many contexts of IS-enabled services (Lee et al., 2021). Therefore, this study adopts, modifies, and extends the PAMISC in the context of IOB. A new research model is developed and presented in <Figure 2>.

<Figure 2> Research Model

The hypotheses are discussed respectively in the following.

The PAMISC posits that when the extent of *confirmation* from using an IS increases, a user's *perceived usefulness (PU)*, a cognitive belief salient to (i.e., a post-use assessment of instrumentality of) IS use (Davis et al., 1989), increases. It also posits that the extent of confirmation and perceived usefulness are positively related to her/his *satisfaction*, an affective belief formed by her/his experience of using an IS (Bhattacherjee, 2001b) and that both perceived usefulness and satisfaction will influence *the use continuance intention.*

PU is defined as "*the degree to which a person believes that using a particular system would enhance his or her job performance*" (Davis, 1989, p.320). As such, it focuses mainly on a system's utilitarian value perceived by the users which can enhance their productivity (Susanto et al., 2016). Due to the rather narrow scope of perceived usefulness, many studies have modified PAMISC by including more post-use instrumentality variables or replacing PU with other

variable(s) to suit their research contexts (e.g., Lee et al., 2021; Susanto et al., 2016). In the context of IOB as well, the concept of perceived usefulness may not be suitable to represent the economic incentives provided by contemporary IOBs, as detailed in section 2.2. The reason why the economic benefit is used in this model is that most of the IOBs attract customers by providing more economic benefits than those of traditional banks. In fact, since the pandemic lockdown, many traditional banks have started to provide contactless and paperless services to their customers, so the relative advantages of IOBs in terms of non-economic benefits (i.e., convenience) have been diminished (Asif et al., 2020). Therefore, we propose *perceived economic benefit* as an important instrumentality assessment variable (instead of PU) for this study (Lee and Kim, 2020). After a while of their initial use, users can assess their level of confirmation, i.e., whether the use of IOBs has met or exceeded their initial expectations in various aspects based on the values provided by the use of an IOB, which could be mainly the economic values.

Therefore, a high level of confirmation in the context of IOB should be positively associated with perceived economic benefits to them. Therefore, this study hypothesizes that,

H1: Users' confirmation is positively associated with perceived economic benefit.

PAMISC posits that confirmation can determine user satisfaction which is the affective belief before the behavioral intention. If users' expectation towards an IOB is realized (i.e., expectation confirmation), their affective belief in IOBs should increase. However, what is more important to induce users' continued use is the fact that customers get to know the traits and characteristics of the service and thus evaluate its trustworthiness, which is an antecedent of customers' ongoing trust leading to the subsequent continuance intention to use (Yu et al., 2015). Based on Social Exchange Theory, if a service is proven trustworthy, users are more likely to believe that the benefit of continued use of this service is larger than its associated risk (Cook et al., 2013). As above-mentioned, satisfaction only measures the degree to which a system can meet users' expectations while ongoing trust captures customers' expectations of a system's future behaviour (Zhou et al., 2010) while financial institutions are dedicated to building customers' trust in them. Thus, we argue that IOB users' *ongoing trust*, which refers to an experience-based trust that is formed through repeated interactions between users and IOBs, should be used as a more suitable affective belief about the use of IOBs. If users' expectations towards an IOB are confirmed after the repetitive experience of using it, they will establish ongoing trust towards IOBs because ongoing trust is an experience-based trust. Therefore,

H2: Users' confirmation is positively associated with customers' ongoing trust.

PAMISC posits that perceived usefulness is positively associated with satisfaction (i.e., A positive relationship between instrumentality assessment and affective assessment). In the same vein, we argue that perceived economic benefit is positively associated with ongoing trust. The underlying reason is that if users perceive that IOBs can provide expected economic benefits to them, they will be more willing to be vulnerable to IOBs to perform a specific task (e.g., placing time deposits with a higher interest rate, getting financing with a lower interest rate, investing in treasure products, purchasing insurance products, etc.) as trust is defined as the extent to which one party is willing to be vulnerable to another party to perform a specific task toward the expected and promised level (Dimitriadis and Kyrezis, 2010; Grabner-Kräuter and Kaluscha, 2003; Zhang et al., 2018). Also, some studies found that the economic benefits brought by technology-enabled banking channels are positively associated with trust (e.g., Kaabachi et al., 2017; Yuan et al., 2019). Therefore,

H3: Perceived economic benefit is positively associated with ongoing trust toward IOBs.

PAMISC posits that post-use instrumentality is also positively associated with users' intention of continued use. The cognitive belief of users will motivate them to have a higher behavioral intention to use an IS. It has been supported by a lot of extant studies in similar contexts of IS-enabled customer services (e.g., Foroughi et al., 2019; Hoehle et al., 2012; Montazemi and Qahri-Saremi, 2015; Vedadi and Warkentin, 2016). In the case of an IOB as well, when a user finds a high level of instrumentality

(i.e., perceived economic benefit in this case), they will more likely have the intention to continue using the services they have with the IOB. Moreover, the relationship between economic benefit and continuance intention has been supported by a lot of extant studies in similar IS-enabled customer services (e.g., Hernandez and Mazzon, 2007; Poromatikul et al., 2020; Vatanasombut et al., 2008; Yuan et al., 2019). Therefore,

H4: Perceived economic benefit is positively associated with the intention of continued use of IOBs.

Kaabachi et al. (2019) argue that online trust is one of the main antecedents of e-loyalty because even if customers are satisfied with the system, they still do not have any loyalty to it without trust. In fact, the intention of continued use may entail the concept of loyalty, which refers to a customer's re-purchasing intention because they like a brand or service (Kaabachi et al., 2019). Trust is like protection against potential risk (Yu et al., 2015). With users' ongoing trust in an IOB, they are more willing to believe that using the IOB continuously will not cause harmful risks to their interests. As such, the study posits that,

H5: Ongoing trust is positively associated with customers' intention of continued use of IOBs.

Cross-buying a new product from the same seller of previously purchased products may involve a buyer with a higher level of risk with the same seller than before (Liu and Wu, 2007) because the buyer is actually purchasing a new product which involves more uncertainty and risk. The establishment of trust in-

volves three beliefs: ability, integrity and benevolence. Ability reflects that the service providers have sufficient knowledge and skills to fulfil customers' goals. Integrity refers to whether service providers can always keep their promises. Benevolence means that service providers can act for customers' best interests (Zhou, 2013). Once the IOB users confirm that IOBs have the ability, integrity and benevolence, they will establish ongoing trust with IOBs which motivates them to use IOBs continuously and more extensively. Therefore, ongoing trust can act as protection against potential risks and unexpected actions associated with the further use of IOBs (Yu et al., 2015). Thus, when a customer has established ongoing trust with an IOB based on their repetitive use of the IOB, the perceived uncertainty associated with cross-buying a new product from the same IOB may be lower (Liu and Wu, 2007). Then, users will have more confidence and willingness to explore other services provided by IOBs. Therefore,

H6: Ongoing trust is positively associated with customers' intention of cross-buying.

Personal innovativeness is defined as the individual's willingness to adopt a new idea earlier than other people (Rogers, 2003). It is also defined as a risk-taking propensity for a new idea (Lu, 2014). Based on Montazemi and Qahri-Saremi (2015)'s literature review on online banking, personal innovativeness is rarely studied in the post-adoption stage in the online banking context, while personal innovativeness has been used as one of the significant direct factors of IOB adoption (Yoon and Lim, 2020, 2021). Based on Aldás-Manzano et al. (2009)'s argument, without considering personal traits, the study of intention formation is too rational to be true, so this study proposes personal innovativeness as

an important moderating factor that affects the relationship between ongoing trust and two behavioral intentions in this study.

The post-adoption stage is not a static situation. Systems often launch new features in order to fit the current needs of users. Also, users actively revise their use of system features in the post-adoption stages to complete their tasks. This behavior is called adaptive system use (ASU) (Sun, 2012). When users encounter unfamiliar things, personal innovativeness is found as a positive moderator for the relationship between this unfamiliar situation and ASU (Sun, 2012). It implies that users with higher personal innovativeness can get used to this unfamiliar situation and revise their use of system features more quickly.

IOBs keep on enhancing existing features and launching new features to optimize their functions. Since IOBs are still emerging in most countries, the users' willingness to explore new features of IOBs is a concern for IOBs to grow. Users with higher personal innovativeness are more willing to discover and accept new features after the system has been adopted (Lu, 2014). As proposed in H4, users with more ongoing trust towards an IOB will have a higher intention of continued use of the IOB. For users with higher personal innovativeness, they have a higher risk-taking propensity to accept a new idea. As such, users with higher personal innovativeness should be able to revise and adapt to the new features of the IOB more quickly and thus have higher intentions of continued use of IOBs, as long as they have a good level of ongoing trust with the IOB. Therefore, this study posits that:

H7: Personal innovativeness positively moderates the relationship between ongoing trust and intention of continued use of IOBs.

As proposed in H6, cross-buying involves a higher level of risk because users are actually purchasing new products from the same sellers. Ongoing trust, which is established from the ability, integrity and benevolence of service providers, acts as a protection against potential risks during cross-buying. Meanwhile, people with higher personal innovativeness have a higher risk-taking propensity to accept a new product from IOBs. As such, users with higher personal innovativeness have a higher intention of cross-buying, as long as they have a good level of ongoing trust with the IOBs. As such, this study posits that:

H8: Personal innovativeness positively moderates the relationship between ongoing trust and intention of cross-buying on IOBs.

Buyers in the later stages of a relationship with a seller have more confidence in the evaluations of the seller than in the earlier stage (Verhoef et al., 2001). As such, an IOB user should have more confidence in evaluating IOB in the later stage of the relationship with the IOB. As mentioned in the argument of H6, cross-buying a new product from the same seller of previously purchased products may involve a buyer with a higher level of risk with the same seller than before (Liu and Wu, 2007). Therefore, if a user has more intention of continued use, they should have more confidence to believe that the associated risk of cross-buying from the same IOB is low based on their repetitive use experience. Therefore, this study posits that:

H9: Intention of continued use of IOBs is positively associated with the intention of cross-buying on IOBs.

Ⅳ. Research Methodology

To test the hypotheses, an online survey via Amazon Mechanical Turk (MTurk) was conducted to collect data. The Partial Least Squares (PLS) technique was used to analyze the data collected.

4.1. Samples and Data Collection

The data was collected by using Amazon's Mechanical Turk (MTurk), an online crowdsourcing platform designed to recruit workers to complete tasks for business and research purposes (Follmer et al., 2017). The target population is the customers who maintain an account(s) with IOBs in the US and Canada. The sampling frame is those existing customers of any of the 15 IOBs in the US and 13 IOBs in Canada (as listed in <Appendix A>) among the MTurk workers. A screening question, "Do you currently maintain (an) account(s) with any of the following Internet-only banks?", was asked before the start of the survey. Only those answering "Yes" could continue the survey. Each participant could get USD 1.00 for the completion of the survey.

IOBs have a long development history and customer penetration rate in the US and Canada. In 2022, 27% of banking customers in the US use IOBs (Effler and Roderick, 2022). Moreover, IOB has a 27-year development history in the US (Lee and Kim, 2020) and a 25-year history in Canada (Achieva Financial, 2018). As of 2022, there are over 15 IOBs in the US while there are over 13 IOBs in Canada, including 3 of them owned by Canadian traditional branch-based banks. The services provided by IOBs in the US and Canada include checking and savings accounts, credit card, mortgage, investment, insurance, line of credit, etc., Such a wide range of services represent that IOB markets in the US and Canada are well-developed. Well-developed IOB markets in the two countries can help us gather relevant data on customers' intention of continued use and cross-buying. Thus, we believe that our analysis of the survey data from these 2 markets can provide good generalizability in the North American financial service industry and inform the emerging IOB markets in other countries.

MTurk was used for the following reasons. First, this platform can reach the target population more easily. Not only does MTurk have a large number of users, but also help researcher select participants based on demographic information (Lee et al., 2021). Second, the reliability of survey data obtained from MTurk participants is supported by many previous studies (Follmer et al., 2017). Third, providing small extrinsic rewards to encourage survey completion can increase the participants' willingness to survey completion without having a significant impact on the effectiveness of sampling. (Lowry et al., 2016)

According to the "10-times rule" recommendation for the data required for statistical analysis using a technique called Partial Least Square (PLS) (Hair et al., 2011), the minimum number of survey data required for a study can be calculated by 10 times the number of relationships (i.e., arrows in <Figure 2>) between variables. Without considering the control variables, there are 9 relationships. Therefore, the minimum number of samples is 90 (9*10). However, to ensure sufficient statistical power, we collected a total of 300 completed survey responses. However, some of the respondents have low attentiveness toward the questions. To reduce respondent bias toward the result, the sampled data, which were completed within 2 minutes and of which the standard deviation of answers with the 7-point Likert scale is lower than 0.2, were removed. After cleansing the data, 233 survey responses are usable, which is still

<Table 3> Descriptive Statistics: Participant Characteristics

Variable	Category	Frequency	Ratio (%)
Gender	Male	134	57.51%
	Female	99	42.49%
Age	18-29	71	30.47%
	30-39	73	31.33%
	40-49	55	23.61%
	50-59	25	10.73%
	>60	9	3.86%
Education	Middle school degree or equivalent	0	0.00%
	High school degree	17	7.30%
	Vocational college degree	21	9.01%
	Undergraduate (University) degree	113	48.50%
	Graduate (University) degree	82	35.19%
Total		233	100%

above the minimum required sample size (Hair et al., 2011). The respondents consist of 57.51% male and 42.49% female. The mode of age group lies in the 30s. Over 83% of the respondents have an undergraduate degree or above. Around 50% of respondents are employed in the private sector. The details of demographic information are shown in <Table 3>.

4.2. Measurement

All constructs are reflectively measured by multiple items (i.e., latent variables), of which the definitions are shown in <Table 4>. All variables are measured with the measurement items retrieved from extant studies and modified based on the features of IOBs. The measurement items are summarized in <Appendix B>. Most questions use a seven-point Likert-scale ranging from "strongly disagree (1)" to "strongly agree (7)" with a neutral point "Neither Agree nor Disagree (4)". The demographic in-

<Table 4> Conceptual Definitions of all Constructs

Constructs	Definition	Reference
Confirmation	Users' cognitive beliefs based on the extent to which users' expectation of IOBs is realized during actual use	Bhattacherjee (2001b)
Perceived economic benefit	Users' perceptions of the economic value of using IOBs	Lee and Kim (2020)
Ongoing trust	Experience-based trust that is formed through repeated interactions between users and IOBs	Lee and Kim (2020)
Intention of cross-buying	Users' propensity to make cross-category purchases in IOBs	Estrella-Ramon et al. (2016)
Continuance intention to use	User's intention to continue using IOBs	Bhattacherjee (2001b)
Personal innovativeness	The degree to which the user is willing to adopt a new idea earlier than other people	Rogers (2003)

formation of participants including age, gender and education level was used as control variables.

4.3. Data Analysis

After collecting the data from Amazon Mturk, PLS was employed to validate the research results using SmartPLS 4.0. PLS analysis aims at maximizing the explained variance of the dependent variables and evaluating the measurement quality (Hair et al., 2014). This analysis method has been widely applied in marketing, information systems, and business research. Since PLS can work well with non-normal data and complex models, it fits with this research with 9 hypotheses with some non-normal data. That is, PLS can address the study's primary objectives of identifying the significance of the relationships presented in <Figure 2> and ensuring the quality of measurement properties of data collected from a survey.

4.3.1. Testing the Internal Reliability

When multiple measurement items are used to measure one construct, internal reliability should be calculated to assess the consistency of the relationship between each measurement item and the construct. For internal reliability, Cronbach's alpha for all the variables is calculated. If the results exceed the minimum acceptability of 0.70 (Gefen and Straub, 2005; Henseler et al., 2016), they indicate that this set of variables is consistent in its intended measure, and measures are internally reliable. As shown in <Table 5>, Cronbach's alphas for all the variables are over 0.7 which indicates that all the measures are internally reliable.

4.3.2. Testing Construct Validity

Convergent validity is a way to evaluate construct validity, i.e., how well the survey measures the construct it was supposed to measure. To measure convergent validity, the factor loadings, the composite reliability (CR) values, and the average variance extracted (AVE) values of each variable were checked. As shown in <Table 5>, the factor loadings are greater than 0.70, which is the ideal threshold correlation value between the original variables and the items (Hair et al., 2010). Secondly, each CR value is greater than the acceptable criteria of 0.70, which means that the variables have enough internal consistency (Aguirre-Urreta et al., 2013). Thirdly, the AVE values are above 0.5, indicating the level of variance captured by our variables is high enough compared to that from measurement errors (Fornell and Larcker, 1981).

As for the discriminant validity, we confirmed it by checking the square roots of the AVE values for all the variables shown in the Fornell-Lacker Criteria in SmartPLS 4.0. The square root values should exceed their inter-correlations with other variables to demonstrate that each variable is uniquely measured by its own constructs. As shown in <Table 6>, only the correlation with ongoing trust (0.875) is slightly higher than confirmation itself (0.854). However, the difference is not so significant (0.021). Also, the surface meanings of confirmation and ongoing trust are different, which does not demonstrate a serious problem with discriminant validity. Other than that, the square root values of variables exceed their inter-correlations with other variables. Taken together, all the results of the above tests suggest that our measurement model is sufficiently reliable and valid.

4.3.3. Common Method Bias (CMB) test

<Table 5> Measurement of Internal Reliability and Convergent Validity

Construct	Loadings	Cronbach's α	Rho	Composite Reliability	Average Variance Extracted
Cross-Buying Intention	CBInt01: 0.856	0.903	0.905	0.932	0.775
	CBInt02: 0.895				
	CBInt03: 0.894				
	CBInt04: 0.876				
Continuance Intention	ContInt01: 0.882	0.877	0.881	0.924	0.803
	ContInt02: 0.912				
	ContInt03: 0.895				
Ongoing Trust	Ontrust01: 0.881	0.895	0.895	0.927	0.761
	Ontrust02: 0.885				
	Ontrust03: 0.875				
	Ontrust04: 0.848				
Perceived Economic Benefit	PEB01: 0.795	0.837	0.838	0.891	0.671
	PEB02: 0.817				
	PEB03: 0.827				
	PEB04: 0.837				
Confirmation	Conf01: 0.848	0.876	0.877	0.915	0.729
	Conf02: 0.849				
	Conf03: 0.864				
	Conf04: 0.855				
Personal Innovativeness	PI01: 0.844	0.844	0.845	0.895	0.681
	PI02: 0.796				
	PI03: 0.829				
	PI04: 0.831				

<Table 6> Fornell-Lacker Criterion: Construct Inter-Correlation Matrix and The Square Roots of AVE's

	CBInt	Conf	ContInt	PEB	Ontrust	PI
CBInt	0.880					
Conf	0.558	0.854				
ContInt	0.585	0.713	0.896			
PEB	0.560	0.845	0.710	0.819		
Ontrust	0.507	0.875	0.692	0.777	0.872	
PI	0.517	0.785	0.616	0.727	0.796	0.825

Note: CBInt = Cross-buying intention; Conf = Confirmation; ContInt = Continuance intention; PEB = Perceived economic benefit; Ontrust = Ongoing trust; PI = Personal innovativeness

As this study collected cross-sectional data and employed a self-rated survey for both the dependent and independent variables, this study might have an issue with common method bias (Podsakoff, 2003). To check the CMB, the method suggested by Liang et al. (2007) has been adopted. This test is conducted in PLS by employing a latent method factor (LMF). First, each indicator is converted into a single-indicator construct. Then, the constructs of this study are converted into second-order constructs and linked with all the single-indicator constructs. After that, all the single-indicator constructs are linked with an LMF. Finally, PLS calculates and evaluates the ratio of substantive variance to method variance. As shown in <Table 7>, the average of substantively explained variances was 0.744 while the average of method-based variances was 0.008. The ratio of substantive variance to method variance was approximately 93:1, indicating that the magnitude of the method variance identified was tiny. This LMF test

<Table 7> Common Method Bias Test Using the Modelling of the LMF

Construct	Indicator	Substantive Factor Loading (R1)	R1²	Method Factor Loading (R2)	R2²
Confirmation	Conf1	0.831***	0.691	0.023	0.001
	Conf2	0.930***	0.865	-0.089	0.008
	Conf3	0.911***	0.830	-0.049	0.002
	Conf4	0.745***	0.555	0.115	0.013
Perceived Economic Benefit	PEB1	0.725***	0.526	0.08	0.006
	PEB2	1.016***	1.032	-0.213*	0.045
	PEB3	0.729***	0.531	0.102	0.010
	PEB4	0.803***	0.645	0.034	0.001
Ongoing Trust	Ontrust1	0.814***	0.663	0.073	0.005
	Ontrust2	0.966***	0.933	-0.087	0.008
	Ontrust3	0.948***	0.899	-0.078	0.006
	Ontrust4	0.757***	0.573	0.097	0.009
Continuance Intention	ContInt1	1.005***	1.010	-0.141**	0.020
	ContInt2	0.864***	0.746	0.053	0.003
	ContInt3	0.821***	0.674	0.086	0.007
Cross-buying Intention	CBInt1	0.905***	0.819	-0.061	0.004
	CBInt2	0.905***	0.819	-0.013	0.000
	CBInt3	0.908***	0.824	-0.021	0.000
	CBInt4	0.801***	0.642	0.096*	0.009
Personal Innovativeness	PI1	0.840***	0.706	0.003	0.000
	PI2	0.888***	0.789	-0.103	0.011
	P3	0.754***	0.569	0.086	0.007
	PI4	0.822***	0.676	0.01	0.000
Average			0.744		0.008

Note: * $p < 0.05$, **$p < 0.01$, *** $p < 0.001$

suggests that CMB is not a big concern.

4.3.4. Testing the Structural Model

The path analysis of the structural model is conducted. The explained variance (R^2), path co-efficients (β) and their levels of significance (t-values) using a bootstrapping method with re-sampling (n = 5000) and PLS algorithm are measured to assess the significance of the hypothesized relationships.

The path coefficient measures the sensitivity of the relationships between independent variables & dependent variables. If the path coefficient is high, the variation of the dependent variable is more sensi-tive depending on the variation of the independent variable. T-values are used to assess each estimated parameter (e.g., beta)'s significance. <Figure 3> shows the explained variances (R^2), the path coefficients (β) and the levels of significance (t-values). All hy-potheses, except H4 and H7, are supported. As for the control variables, none of them has a significant
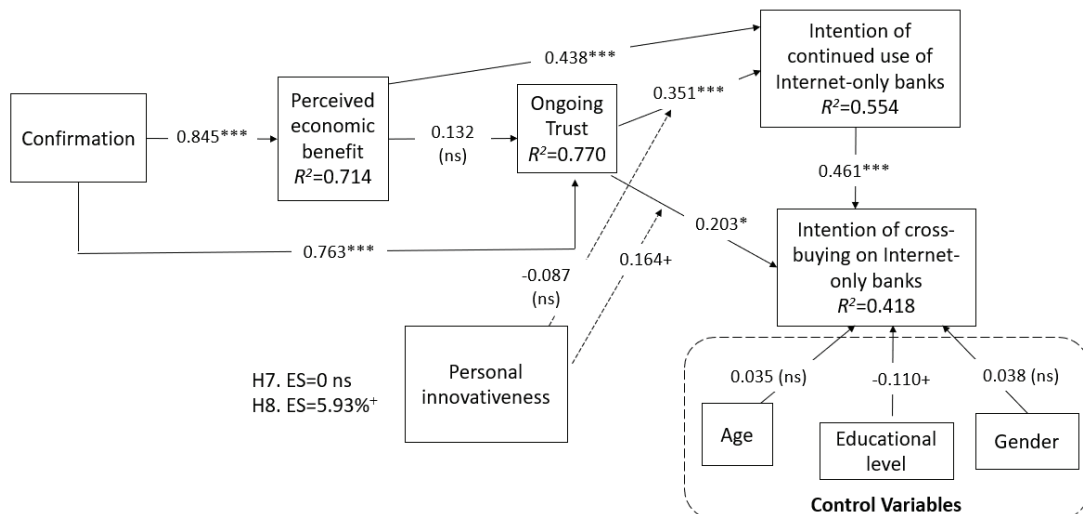
relationship with the dependent variable, the in-tention of cross-buying.

R^2 shows the amount of variation of endogenous variables that is explained by the exogenous variables. It is an indicator of the predictive power of the model. (Chin, 1998; Gefen et al., 2000). As shown in <Figure 3>, 71.4% variance of perceived economic benefit, 77.0% variance of ongoing trust, 55.4% variance of the intention of continued use of Internet-only banks and 41.8% variance of the intention of cross-buying on Internet-only banks can be explained in this model. Since all the R^2 are greater than 10%, these results indicate that this model is substantive and satisfactory (Falk and Miller, 1992).

Ⅴ. Discussion

5.1. Findings

Confirmation is significantly and strongly asso-

Note(s): += p <0.1, *= p <0.05, **= p <0.01, ***= p <0.001

<Figure 3> Structural Test Result (N = 233)

ciated with perceived economic benefit and ongoing trust (β = 0.845 and 0.763 respectively at the significance level of 0.001) so the H1 and H2 are supported. It implies that if customers' expectation towards the IOBs is fulfilled, they will perceive more economic benefit generated from IOBs, i.e., higher post-use instrumentality. Also, they will establish more ongoing trust towards IOBs, i.e., affective belief.

The perceived economic benefit is significantly associated with the intention of continued use of IOBs (β = 0.438 at the significance level of 0.001) so H4 is supported. However, the perceived economic benefit does not have a significant relationship with ongoing trust (β = 0.132 and p-value > 0.1) so H3 is not supported. It implies that only the perceived economic benefit is not sufficient for the formation of ongoing trust in IOBs. Instead, some other factors, like the functionality of the application, service quality, etc., which could have been embedded in the assessment of confirmation by users, could also be taken into consideration. However, as long as IOBs continue to provide economic benefits to users, they are more likely to use them continuously.

Ongoing trust is significantly associated with the intention of continued use of IOBs (β = 0.351 at the significance level of 0.001) so H5 is supported. It shows that if users have a more experience-based trust based on positive interactions with IOBs, they will have more intention to use IOBs continuously. The relationship between ongoing trust and intention of cross-buying on IOBs is also significant (β = 0.203 at the significance level of 0.05) so H6 is supported. It implies that when users establish ongoing trust with IOBs, they are more likely to consider that the risk associated with cross-buying on IOBs is lower and thus have more intention to do so.

The intention of continued use of IOBs is significantly associated with intention of cross-buying on IOBs so H9 is supported (β = 0.461 at the significance level of 0.001). It implies that if the users have more intention to use IOBs continuously, they will be more willing to explore new products in IOBs because they are more familiar with IOBs after continuous use and thus think that the associated risk of cross-category purchases is lower. Here, this relationship is stronger than the positive relationship between ongoing trust and intention of cross-buying on IOBs. The reason can be that the establishment of ongoing trust first motivates users to use IOBs continuously. After that, users gradually accept new product categories sold on IOBs. These results suggest a possibility that the intention of continued use of IOBs could partially mediate the relationship between ongoing trust and the intention of cross-buying intention.

In order to examine the inter-relationships among ongoing trust, continuance intention, and cross-buying intention, a post-hoc test of the mediating effect of the intention of continued use on the link between ongoing trust and cross-buying intention is conducted. Before adding the intention of continued use of IOBs, the association between ongoing trust and intention of cross-buying on IOBs is significant with a path coefficient of 0.508 and t-value of 7.984 by running bootstrapping in PLS. After adding the intention of continued use of IOBs and running bootstrapping again, the path coefficient of ongoing trust and intention of cross-buying on IOBs decreases to 0.196 with a t-value of 2.286. It indicates that *the association between ongoing trust and intention of cross-buying* is *partially mediated by the intention of continued use*. Also, the PLS result shows that the indirect effect of the intention of continued use towards the relationship between ongoing trust and intention of cross-buying is significant at a t-value of 4.992. Therefore, the relationship between ongoing

trust and intention of cross-buying is partially mediated by the intention of continued use of IOBs, which is shown in <Table 9>.

As for the moderating effect of personal innovativeness (PI), it is tested by the procedure introduced by Chin et al. (2003) with a calculation of effect sizes (Cohen, 2013), path coefficients and the level of significance of the interaction term (predictor variable*moderator variable) in PLS. As shown in <Table 8>, the moderating effect of personal innovativeness on the relationship between ongoing trust and intention of continued use of IOBs is not significant. Also, there is no change in explained variance after adding personal innovativeness, so the effect size is 0% (H7 not supported). As for PI's moderating effect on the relationship between ongoing trust and intention of cross-buying on IOBs, the t-value is 1.95 with the effect size is 5.93% (= (0.413-0.376)/ (1-0.376)), which indicates that H8 is marginally supported with small effect size. It

<Table 8> Results of Hypothesis Testing

	Path Coefficients	t-Values	Supported?
H1: Conf → PEB	0.845	29.345***	Yes
H2: Conf → Ontrust	0.763	9.176***	Yes
H3: PEB → Ontrust	0.132	1.407 ns	No
H4: PEB → ContInt	0.438	4.681***	Yes
H5: Ontrust → ContInt	0.351	3.938***	Yes
H6: Ontrust → CBInt	0.203	2.285*	Yes, partially mediated by ContInt
H9: ContInt- → CBInt	0.461	5.135***	Yes
Moderator:			
H7: PI * Ontrust → ContInt	-0.087	1.013 ns	No
H8: PI * Ontrust → CBInt	0.164	1.953[+]	Yes, marginally supported
Control variables:			
Age → CBInt	0.035	0.773 ns	No
Gender → CBInt	0.038	0.344 ns	No
EduLevel → CBInt	-0.110	1.884[+]	Yes, marginally supported

Note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

<Table 9> Mediating Effect of the Intention of Continued Use

	Path Coefficient	t-Value
Ongoing trust → Intention of cross-buying	0.508	7.984***
Mediator: Intention of continued use of IOBs		
Ongoing trust → Intention of continued use of IOBs	0.691	12.927***
Intention of continued use → Intention of cross-buying	0.450	5.033***
Ongoing trust → Intention of cross-buying	0.196	2.286*
Indirect effect		
Ongoing trust → Intention of continued use → Intention of cross-buying	NA	4.992***

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

means that a unit increase in the PI marginally increases the path coefficient of ongoing trust on the intention of cross-buying on IOBs by $\beta = 0.164$. It shows that users with more personal innovativeness have a stronger relationship between ongoing trust in an IOB and their intention of cross-buying.

Except for education level, the other 2 control variables do not have a significant relationship with the intention of cross-buying. Education level has a marginal but negative significant relationship with the intention of cross-buying ($\beta = -0.110$ at the significant level of 0.1). It can be explained by the fact that people with higher education levels tend to have a higher income level. They could be a customer of IOB but when they want to extend their banking services other than basic checking or savings accounts, they may look for traditional (i.e., personalized) banking services but not IOB.

5.2. Theoretical Contributions

This study brings theoretical contributions to IS literature in several ways.

First, this study can shed light on the literature on IT-enabled contactless financial services by investigating current IOB customers' intention of continued use and cross-buying. Although IOBs have been developed over 26 years, extant studies are mostly about users' initial adoption of the service. Undoubtedly, factors of IOB adoption are important for emerging markets but more studies should be conducted on the intention of continued use and cross-buying, which are more important for IOBs in more developed markets to sustain and develop. In fact, IOBs have been developed in the US and Canada for over 25 years while there are over 15 IOBs in the US and over 13 IOBs in Canada. However, as we discussed in sections 2.3 and 2.4, relatively fewer empirical studies have investigated the phenomena related to IOB users' post-adoption behaviors compared to those on initial adoption, and little empirical study has investigated the factors leading to the cross-buying intention of various financial services (e.g., bancassurance and leading services) offered by IOBs. Therefore, our findings on current IOB users' post-adoption behaviors of IOBs in terms of continuance intention and cross-buying intention should contribute to the body of knowledge on the adoption of IT-enabled financial services.

Second, this study can contribute to the PAMISC (Bhattacherjee, 2001) by modifying it to fit the IOB context. Four important variables (perceived economic benefit, ongoing trust, personal innovativeness and intention of cross-buying) have been introduced into the model, including a new dependent variable. This study focuses on perceived economic benefits rather than perceived usefulness due to the importance of economic benefits (over system usefulness) for IOBs to attract users. Under fierce competition, it is important for financial institutions to establish long-term relationships with their customers (Oertzen and Odekerken-Schröder, 2019). Therefore, this study introduced ongoing trust, as an indicator of both satisfaction and loyalty, to explain the post-use cognitive and affective belief. Since inducing customers' intention of continued use can only help IOBs sustain but not further grow, the cross-buying intention is added to the model as one of the dependent variables to figure out what factors can help IOBs grow further, especially in more developed markets. The original PAMISC does not consider any personal trait. Without considering personal traits, the study of intention formation is too rational to be true (Aldás-Manzano et al., 2009).

Third, this study takes personal innovativeness into consideration. Montazemi and Qahri-Saremi

(2015)'s literature review on online banking suggested that personal innovativeness is rarely studied in the post-adoption stage. Lu (2014) also mentioned that researchers have paid insufficient effort to explore the effect of personal innovativeness in a post-adoption context. Post-adoption is not a static stage. Users will keep on exploring new features of the information systems in order to complete a large variety of tasks. Also, technology developers are dedicated to optimizing the features and functions of information systems to better fit the changing needs of users. Personal innovativeness can indicate whether users are willing to accept those new features and functions of the existing systems. Therefore, this study can provide insight about the moderating role of personal innovativeness toward affective belief and behavioral intention.

5.3. Practical Contributions:

This study also brings practical contributions to IOBs in several ways.

First, this study shows that perceived economic benefits can induce customers' intention to continue the use of IOB. If IOBs keep on providing economic benefits to their customers, they are more likely to use IOBs continuously. Thanks to the development of information technology, IOBs have developed rapidly in the last two decades. However, the strategies used by IOBs are mainly monetary. They provide higher deposit interest rates, charge lower lending interest rates and zero or very low transaction fees to attract customers. However, this tactic will increase IOBs' operating costs and may cause a serious problem in their financial sustainability. Moreover, if financial institutions rely on the provision of economic benefits to maintain long-term relationships with customers, it may cause a "price war" among IOBs and

even traditional banks. Subsequently, the profitability of the whole financial sector may be influenced by this price war.

Second, this study can help IOBs understand that the offer of economic benefits may not necessarily help them gain customers' trust. The result shows that perceived economic benefit does not have a significant relationship with ongoing trust. It is time for IOBs to think about what they can do to establish a long-term relationship with customers other than merely offering economic benefits. For example, some studies found that service quality, including reliability, responsiveness, assurance and empathy, is positively related to customers' trust (Montazemi and Qahri-Saremi, 2015, Zhou et al., 2010). Since IOBs do not maintain any physical branch, users may find it difficult to seek assistance during usage. Therefore, IOBs should ensure their system reliability in order to reduce customers' need to seek assistance. Also, IOBs should educate users that they can seek help by phone or email if the problem exists. Moreover, they should ensure that the response rate of these channels is high. Then, users are more willing to use IOBs continuously after being attracted by the initial economic benefit. Although the research is based on the US and Canada where IOBs are well-developed, it can provide a good reference for other markets with high penetration rates and development history to sustain and further expand their markets.

Third, this study can highlight the factors that IOBs mainly focus on to improve the continued use of service and ongoing engagement with their customers by proposing the factors related to cross-buying intention. Nowadays, it is common for banks to cross-sell different banking, insurance and investment products. This study shows that the intention of continued use is positively associated with in-

tention of cross-buying on IOBs. Also, the intention of continued use partially mediates the relationship between ongoing trust and cross-buying intention. It implies that IOBs should first attract users' continuance intention before inducing their cross-buying intentions. Although satisfaction is constantly found as an antecedent of continuance intention to use (Ofori et al., 2017), Verhoef et al. (2001) found that satisfaction does not have a significant effect on cross-buying. This study demonstrates that ongoing trust, as an indicator of both satisfaction and loyalty, can act as a protection against potential risk towards continued use and cross-buying on IOBs. Therefore, IOBs should focus more on inducing ongoing trust rather than satisfaction only if they would like to attract customers' cross-buying intention.

Fourth, this study shows IOB practitioners how the personal traits of existing users affect the further expansion of IOBs. Although personal innovativeness only has a marginally significant moderating effect on the relationship between ongoing trust and cross-buying intention, it shows that IOB practitioners should also consider the personal traits of users before designing the features and functions of IOBs.

Fifth, the negative association between education level and intention of cross-buying is found to be marginally significant. Customers with higher education levels are less likely to cross-buy other banking products on IOBs. It is believed that more educated people have higher incomes and wealth. They may prefer traditional (i.e., personalized) banking services but not IOB if they would like to look for more complicated services. It shows that IOBs still have an image of merely providing simple banking services. Although IOBs do not have physical branches or provide in-person service to customers, the product range of IOBs is wide, or even similar to that of

traditional banks. Therefore, if IOBs want to get into the market of those high-net-worth customers, they should try to provide more "personalized" service to them. For example, they can apply AI and machine learning to recommend investment products which fit customers' needs and goals. Also, they can enhance their chatbot functionality and response rate of phone banking, so that customers can get assistance on a 24/7 basis.

The combination of the results discussed above has a deeper implication for the service providers of IOB. The insignificant relationship between perceived economic benefit and ongoing trust suggests that these are two separate perspectives, from which the service providers can develop respective strategies to gain and retain their customers. On one hand, the economic benefits are the perceivable incentive attracting customers. On the other hand, due to the current typical setting of IOB, these services have their weaknesses (e.g., lean and slow-responsive communication between customers and service providers) that are incomparable to traditional banking services. The weaknesses can reduce the trust of customers making them perceive being vulnerable to potential risks. Trust is an important indicator for the wellness of business relationships. Unfortunately in our case, the economic benefits did not directly influence ongoing trust, which result implies that IOB service providers need to have some extra implementation to enhance customers' trust and then strengthen their relationship with customers. This can be achieved, for instance, by implementing strong safeguards (e.g., better customer asset insurance) and interactive customer relationship management that can help to quickly answer customers' personalized questions and address their concerns. Our research showed that education had a direct effect on the intention of cross-buying. This result suggests that

personalized IOB services have the potential to increase revenues. In particular, the current communication and remote meeting technologies make it easy for IOB service providers to provide in-time and interactive services that are comparable to traditional banking services.

5.4. Limitations and Future Research

Despite its contributions, this study has several limitations.

First, the survey data is collected from MTurk. The decrease in reliability and validity of data collected from MTurk has triggered a lot of concern about the quality of psychological research since 2018 (Chmielewski and Kucker, 2020). This study has followed multiple suggestions made by Aguinis and Ramani (2021) including getting at least an addition of 15%-30% of MTurkers, the use of Qualtrics to keep track of MTurk ID, the use of attention check, data screening, etc. Although reverse-coded questions have been added, there are still over 20% of responses answered with low attentiveness (i.e., answered within 2 minutes and answers with a standard deviation of the Likert-scale answers lower than 0.2). Although the final sample size is still over the minimum number of samples suggested by Hair et al. (2011), the honesty and integrity of those 233 respondents cannot be verified. Aguinis and Ramani (2021) also suggested that fair pay can bring better performance on the research task. In a future study, the compensation rules should be reviewed. Also, researchers can work with IOBs to get their users' consent to join the survey which can enhance the reliability and validity of data.

Second, only one post-use instrumentality, perceived economic benefit, has been considered in this study. Based on the literature review, some post-use instrumentalities, e.g., system quality, convenience, etc., could have significant relationships with continuance intention (and probably with cross-buying intention). Although this study finds that perceived economic benefit does not have a significant relationship with ongoing trust, it cannot show which post-use instrumentalities are associated with ongoing trust. In a future study, more post-use instrumentalities should be included, especially in the context of post-adoption of IOBs which does not have a lot of relevant studies.

Third, only one personal trait (perceived innovativeness) has been studied in this study as this variable is widely identified from extant studies on IOBs and online banking as a direct factor. However, other personal traits (e.g., computer self-efficacy, and customers' propensity to trust (Montazemi and Qahri-Saremi, 2015) may also affect the intention of continued use and cross-buying. Also, this study takes personal innovativeness as a moderator while some studies treated it as one of the independent variables. In a future study, their relationships with dependent variables should be further examined.

Fourth, confounding issues might have arisen from the survey participants' confusion between IOBs and online banking services offered by traditional brick-and-mortar banks. It has come to light that survey respondents might have inadvertently conflated these distinct concepts, as evidenced by their responses to survey items outlined in <Appendix A>. For instance, established traditional banks like Citibank and Charles Schwab, which maintain physical branch offices in the U.S., are recognized for their solid online banking services. Given this conflation, a critical step towards refining the study's outcomes would involve segregating the dataset to encompass only responses from the U.S. and Canada.

Fifth, the collected data has some degree of in-

ter-collinearity issues among variables. Table 6 shows that some inter-correlations are higher than 0.70. We nonetheless have kept those variables after checking Fornell-Lacker Criteria in SmartPLS 4.0 that the square root values of the variables do not exceed their inter-correlations with other variables, except that fact that the correlation with ongoing trust is slightly higher than confirmation itself with a small difference of 0.021. Also, the surface meanings of highly correlated variables are still distinct from one another. This limitation of inter-collinearity could have been caused by data collection with MTurk, where the respondents were less attentive when answering questions than we expected. Therefore, future research should collect data not from MTurk but from more attentive groups of respondents.

Ⅵ. Conclusion

The purpose and research question of this study is to examine what factors lead to customers' intention of continued use and cross-buying on IOBs by extending the Post-Acceptance Model of IS Continuance (PAMISC). Specifically, this study proposes a model that investigates the relationships among current IOB users' degree of confirmation, perceived economic benefits, ongoing trust and their intention of continued use and cross-buying on IOBs based on the PAMISC. It also treats personal innovativeness as a moderator. The result shows that confirmation has a significant association with both perceived economic benefit and ongoing trust, but the perceived economic benefit does not have a significant relationship with ongoing trust. However, ongoing trust has a significantly positive association with the intention of continued use and the intention of cross-buying. Also, the intention of continued use mediates the association between ongoing trust and the intention of cross-buying. Personal innovativeness is found to have a marginally significant moderating effect on the association between ongoing trust and intention of cross-buying. This study sheds light on the literature on contactless financial services and PAMISC. IOB practitioners should also revisit the effectiveness of economic benefits for the establishment of a long-term relationship with customers and consider the personal traits of current IOB users and their intention of continued use when inducing cross-buying intention.

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<Appendix A> List of IOBs Used by the Participants

IOBs in the US	IOBs in Canada
1. American Express	1. Tangerine Bank
2. Discover Bank	2. EQ Bank
3. Charles Schwab Bank	3. Simplii Financial
4. Ally Bank	4. Manulife Bank
5. Capital One	5. Motusbank
6. Marcus by Goldman Sachs	6. Alterna Bank
7. Varo Bank	7. Outlook Financial
8. E Trade Bank	8. AcceleRate Financial
9. TIAA Bank	9. Achieva Financial
10. Barclays	10. Hubert Financial
11. Synchrony Bank	11. Implicitly Financial
12. Axos Bank	12. Questrade
13. Citi	13. Neo Financial
14. CIT Bank	
15. Sallie Mae Bank	

<Appendix B> Measurement Items

Construct	Measurement items	Sources
Intention of cross-buying on IOBs	• I intend to increase my volume of business with IOBs. • I intend to buy more products from IOBs. • I will take an opportunity to cross-buy if IOB offers. • I will seriously consider the offer if it is from the IOB I used.	Hong and Lee (2012); Mukerjee (2020)
Intention of continued use of IOBs	• I intend to continue my use of IOBs in the future. • I plan to use IOBs in the future. • I predict that I will use IOBs in the future.	Lee and Kim (2020)
Perceived economic benefit	• IOBs allow me to save money since they charge lower (or no) transaction fees. • If I get a loan from IOB, I will save money for the interest I need to pay for the loan from IOB. • IOBs are more advantageous to me because they pay higher interest for savings or investment accounts. • I think it is economical to use IOBs.	Kaabachi et al. (2017); Yoon and Lim (2021)
Confirmation	• The system functionality provided by IOBs meets my expectations. • The convenience and economic benefits provided by IOBs meets my expectation. • The security level of IOBs meets my expectations. • Overall, the use of IOBs meets my expectations.	Bhattacherjee (2001a); Bhattacherjee (2001b)
Ongoing trust	• Based on my experience with the IOB(s) that I'm currently using, • IOB is trustworthy • IOB has high integrity. • IOBs fulfill the commitments it assumes. • The design and commercial offer of IOBs takes into account the desires and needs of its customers.	Hoehle et al. (2012); Yuan et al. (2019); Thakur (2014)
Personal innovativeness	• If I hear about new information technology, I will look for ways to experiment with it. • Among my peers, I am usually the first to try out new information technologies. • I like experimenting with new information technologies • In general, I am willing to try out new information technologies.	Lee et al. (2021); Oliveira et al. (2016)

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