



**Migration and Financial Transactions: Factors Influencing
Mobile Remittance Service Usage in the Pandemic**

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ABSTRACT

COVID 19 had devastating consequences for the migration crisis. Workers were confined to their locations due to travel restrictions, and working from home became “working away from home” for millions of migrant workers. Mobile financial services emerged as the primary livelihood of mobile remittance recipients. It is essential for service providers to gain insights into users’ motives for using mobile remittance services. Thus, this study proposed a model by extending the UTAUT model and integrating it with perceived cost and perceived security. Based on the survey data (n=344), the proposed model was tested using ANOVA. The findings reveal that performance expectancy, effort expectancy, perceived cost, and perceived security affect users’ behavioral intention to use mobile remittance applications. Social influence non-significantly affects behavioral intention, and there is no significant influence of facilitating conditions on users’ behavior. Under the pandemic crisis conditions, the findings of the study provide several practical implications on how service providers could improve their products and services to increase mobile remittance application usage.

Keywords: Mobile remittance, technology adoption, UTAUT, migrant worker, remote working practices

1. Introduction

International migration has introduced major development opportunities and poverty implications for both destination and origin countries. The number of international migrants reached 272 million in 2019, which equates to 3.5 percent of the global population (United Nations, 2019). Migration benefits countries of destination as it potentially solves demographic and economic issues, including ageing populations, provides commercial growth, and enables greater international cooperation. (Crisis Centre, 2020). Migrants seeking work and economic benefits, such as in Europe and other developed economies, have been shown to present weaker labor market performance (IMF, 2017) defined by lower employment rates and salaries than resident home labor market participants. Conversely, economic migrants and migrant workers provide an important livelihood to their families in the world’s poorest countries. Governments and commercial sectors view mobile phone apps as a way to find solutions to issues faced by migrants at the micro level, including international mobile money transfers. In these challenging times of COVID, a robust mobile service can help deliver economic impact to the countries of origin through remittance (PwC, 2020). Therefore, this study aims to explore the factors affecting migrant workers’ acceptance of mobile services while they work away from their home countries.

According to the World Bank (2020), global remittance flows exceeded \$714 billion in 2019, and low-and middle-income countries (LMICs) received \$554 billion in the previous year, which represents an annual increase of 4.7 percent (approximately \$27 billion). Remittance is the monetary transfer sent by migrants from their countries of residence to their home countries (Sørensen, 2014). Matuzeviciute and Butkus (2016) showed that remittances have a positive influence on the long-term economic growth. Reducing remittance costs would increase the amount transferred, encouraging people to remit more through formal remittance channels (Schiantarelli, 2005). Mobile money transfers (MMTs) are largely used for international services; therefore, mobile remittance refers to international mobile money transfers based on the

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3 definition of Mobey Forum (2014). Kenya was the origin of these services when Safaricom
4 Company launched the M-PESA application in 2007, allowing the unbanked to use mobile
5 technology to transfer money. Following the success of M-PESA, many companies have focused
6 on mobile money transfer markets, such as Airtel Money (India), Equitel Money (Kenya), Tigo
7 Cash (Chad, Democratic Republic of Congo, Ghana), Vodafone Cash (Ghana), MTN (Uganda),
8 Gcash (the Philippines), EMQ (Hong Kong), Mpay (Indonesia), Qpay (Taiwan), Vietmoney
9 (Taiwan).

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11 The GSMA investigated the impact of mobile money transfers on sustainable development
12 and showed that these remain pivotal to social and economic development (Lopez, 2019).
13 Compared to traditional means, mobile remittance enables higher transfer volumes by reducing
14 sending time, handling costs, and enhancing safety and convenience (Munyegera and Matsumoto,
15 2016). Previous studies have also demonstrated that perceived cost affects users' behavioral
16 intention to adopt mobile money transfers (Tobbin & Kuwornu, 2011). Existing scholars attempted
17 to analyze mobile money transfer acceptance based on users' awareness of information technology,
18 such as perceived usefulness, effectiveness, and perceived ease of use (Narteh *et al.*, 2017).
19 Perceived security is also seen as a crucial factor affecting the adoption of mobile money transfers
20 because the service is closely linked to user privacy (Benson *et al.*, 2016). Mobile remittances have
21 a huge potential for emerging markets in Asia, wherein there is a high percentage of migrant
22 workers who have left their home countries in search of better income opportunities in high-income
23 countries. The success of M-PESA significantly impacted the perception of operators in emerging
24 Asia-Pacific markets. However, the awareness of mobile remittances in Asia remains low.

25
26 Earlier studies have analyzed the adoption of mobile money transfer services and revealed
27 several factors that impact the acceptance of mobile financial services. Two constructs have also
28 been confirmed as determinants affecting the intention of other mobile financial services, such as
29 mobile banking and mobile payment (Chang, 2014; Khalilzadeh, Ozturk, and Bilgihan, 2017; Le,
30 Ngo, Trinh, and Nguyen, 2020; Rind *et al.*, 2017; Singh and Srivastava, 2018; Tse *et al.*, 2019).

31
32 Literature showed that the risk of mobile remittance is not a concern for users in crisis (Ryu,
33 2018) and information and communication technology may complement remittance to reduce
34 constrains for business (Asongu *et al.*, 2019). Migrant workers from the bottom of the economic
35 pyramid in Asia mostly intend to use mobile remittance service due to the cost considerations of
36 the commission fees and transport costs (Sivapragasam *et al.*, 2011). Mirabaus (2009) also
37 investigated migrant's remittances and mobile transfer in emerging markets and highlighted a
38 further need for empirical investigations as under the fragile conditions of migrant working
39 conditions and the high risk of their income loss to the livelihood of their dependents. Emergent
40 markets started offering mobile remittance service such as Bangladesh (Rahman & Sloan, 2015),
41 Kenya (Misati, Kamau, & Nassir, 2019), and Zimbabwe (Mutsonziwa & Maposa, 2016) but the
42 migrant situation in Asia poses a variety of challenges around mobile financial technology
43 acceptance as opposed to African context. The services received government approval only at the
44 start of the COVID crisis and the technology is nascent while the economic situation of migrants
45 is fragile. Hence, there is a need to identify factors affecting the intention to use mobile remittance
46 transfer in Asia.

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48 This study fills the research gap in understanding the uses of working away from home and
49 mobile technology by migrants during the pandemic in Asia. Two research questions are proposed:
50 (1) What are the factors linked to the intention to use mobile remittances during the pandemic? (2)
51 What is the impact of these factors on the behavioral intention to use mobile remittances during
52 the pandemic?
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3 A theoretical model is developed by combining the unified theory of acceptance and use of
4 technology (UTAUT) and two additional constructs: perceived cost and perceived security. The
5 UTAUT has been applied to explore customers' adoption of technology in several studies in mobile
6 money services in general (Baptista & Oliveira, 2015; Ibidunmoye, 2018; Musa, Khan, & AlShare,
7 2015; Savic & Pešterac, 2019) and mobile money transfer in particular (Mensah, Chuanyong, &
8 Zeng, 2020; Warsame & Ileri, 2018).

9
10 The COVID pandemic is expected to reduce the volume of cross-border mobile remittances.
11 For example, pre-pandemic African electronics payments industry generated revenues of above
12 \$19.3 billion, of which \$9.3 billion was from remittances and cross-border payments (Girancourt
13 *et al.*, 2019). The reduction in the mobile remittance volume is expected to be 50%. While this may
14 be attributed to the economic downfall, there is a need to gain a better understanding of the
15 acceptance of mobile remittance technology by this user segment during a crisis in regions where
16 there is a low level of mobile remittance awareness.

17
18 The study identifies performance expectancy effort expectancy, perceived cost, and perceived
19 security influence behavioral intention to use mobile remittance applications. Social influence non-
20 significantly affects behavioral intention, and there is no significant influence of facilitating
21 conditions on users' behavior. The theoretical contribution comprises the crucial determinants
22 which help predict intention to use mobile remittance application in the pandemic and contribute
23 to extend the application of UTAUT. Therefore its practical implications are important for mobile
24 remittance service providers to design convenient and effective applications for migrants working
25 away from home.
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28 **2. Literature Review and hypotheses development**

29 *2.1 Theoretical background*

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32 Davis (1989) proposed the technology acceptance model (TAM) based on the theory of
33 reasoned action (TRA) and the theory of planned behavior (TPB) and applied it to various contexts.
34 TAM is useful for explaining the behavior of adopting a new information technology by
35 establishing the relationship between two variables: perceived usefulness (PU) and perceived ease
36 of use (PEU). TAM assumes that PU and PEU affect attitude, and attitude also affects users'
37 intentions (Davis, Bagozzi, & Warshaw, 1989). However, Mathieson, Peacock, and Chin (2001)
38 indicated that TAM has limited explanatory and predictive power because other factors may be
39 important to the usage behavior (e.g., perceived of resources). Venkatesh, Morris, Davis, and Davis
40 (2003) compared the main existing models in technology acceptance and proposed UTAUT.
41 According to the UTAUT, expected performance, expected effort, and social influence are the three
42 components that determine the intent to use information technology while facilitating conditions
43 that directly affect use behavior (Figure 1).
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47 Figure 1 UTAUT model
48 (Source: Venkatesh *et al.* 2003)

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50 UTAUT considers the influence of peripheral factors (gender, level, age, experience, and
51 voluntariness) on the intention to use and use behavior. The UTAUT model has recently been tested
52 and applied to determine the user acceptance of mobile technologies. For example, Baptista and
53 Oliveira (2015) integrated UTAUT, task-technology fit, and information technology management
54 to investigate mobile banking adoption and revealed that performance expectancy and technology
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characteristics had a positive impact on behavioral intentions of users. Savic and Pešterac (2019) concluded that all constructs of the UTAUT model have a statistically significant impact on the acceptance of mobile banking. This study modifies the UTAUT model by adding two factors: perceived cost and perceived security. This is because UTAUT is considered to be the most complete model for predicting the acceptance of information technology (Martins *et al.*, 2014). Existing researchers have identified the significance of perceived cost and perceived security (Pantano and Di Pietro, 2012; Yu, 2012; Rind *et al.*, 2017; Khalilzadeh *et al.*, 2017) and have proved that information security is linked to users' behavioral intentions to use mobile payment services. Hence, this research uses this model to explore factors influencing behavioral intention in the context of mobile remittances.

2.2 Research model and hypotheses

Figure 3 Research model

This study adopted the UTAUT model and added two determinants (perceived security and perceived cost) to propose our research model (Figure 2). Mobile users have perceived costs (PC) that may influence behavioral intention while using mobile remittance application such as hardware/software costs and transactions cost. In addition, perceived security (PS) issue like fraud, financial losses, or leaks may influence behavioral intention of mobile remittance. Venkatesh *et al.* (2003) defined performance expectancy (PE) as “the degree to which an individual believes that using the system will help him or her to attain gains in job performance”. They proposed that PE factor is driven by perceived usefulness (TAM/TAM2 and C-TAM-TPB), relative advantage (IDT), extrinsic motivation (MM), job-fit (MPCU), and outcome expectations (SCT). Furthermore, PE is discovered as the strongest predictor of users' intention to use information technology. Previous studies applied PE and proved that it has a positive influence on the behavioral intention. For example, Cimperman, Brenčič, and Trkman (2016) surveyed on the acceptance of home telehealth service in Slovenia, and PE was proved to have a positive impact on behavioral intention to adopt the service. The construct also appeared in the study of Madigan *et al.* (2016) which revealed PE as the strongest factor of behavioral intention to use automated road transport systems. Moreover, Tse *et al.* (2019) stated that PE is the customers' requirement of the mobile payment system; therefore, it influences behavioral intention. Within the mobile banking context, many scholars also concluded that PE is one of the most important determinants of behavioral intention of users (Baptista & Oliveira, 2015; Basri, 2018; Merhi, Hone, & Tarhini, 2019; Savic & Pešterac, 2019). In this study, customers' use of remittance app will help them increase payment tasks performance; this may lead to PE influencing the behavioral intention to use mobile remittance app.

H1: Performance expectancy (PE) is positively associated with behavioral intention (BI) of mobile remittance apps.

Venkatesh *et al.* (2003) defined effort expectancy (EE) as “the degree of ease associated with the use of the system.” EE is driven by the construction of three models: perceived ease of use (TAM/TAM2), ease of use (IDT), and complexity (MPCU). Several existing studies, such as the acceptance of mHealth in Bangladesh (Hoque & Sorwar, 2017), prediction of the intention to use transport systems (Madigan *et al.*, 2016), and the exploration of factors affecting users in utilizing the integrated licensing service information system (Puspitasari, Firdaus, Haris, & Setyadi, 2019) concluded that there was a positive relationship between EE and behavioral intention. In the mobile money context, Zhou, Lu, and Wang (2010) explored the determinants of mobile banking in China

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3 and confirmed that the effort expectancy has a significant impact on user adoption. Albashrawi,
4 Kartal, Oztekin, and Motiwalla (2019) surveyed US bank clients about intentions to use mobile
5 banking and revealed that effort expectancy positively influenced the behavior intention of users.
6 Mensah *et al.* (2020) proved that the continued intention to use mobile money transfer services
7 among university students in Ghana is influenced by effort expectancy. To explain effort
8 expectancy toward the intention to use mobile remittance apps, the author proposes the following
9 hypothesis:

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12 *H2: Effort Expectancy (EE) is positively associated with behavioral intention (BI) of the mobile*
13 *remittance app.*
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15 According to Venkatesh *et al.* (2003), social influence (SI) is “the degree to which an individual
16 perceives that important others believe he or she should use the new system”. Users’ intentions are
17 affected by the individual or group of references, such as friends, relatives, and colleagues. Social
18 influence is described as a subjective norm in the theory of reasoned action (Fisbein & Ajzen, 1975).
19 The findings from study of Slade, Dwivedi, Piercy, and Williams (2015) revealed that SI was the
20 strongest predictors of behavioral intention to use mobile payment in the United Kingdom. A
21 positive association between social influence and intention to use was confirmed by several
22 scholars: Rakhmawati and Rusydi (2020) on the intention to use e-filing tax compliance,
23 Khalilzadeh *et al.* (2017) on customers’ intention to use mobile payment in the restaurant industry,
24 Bhatiasevi (2016) and Le *et al.* (2020) on the decision to use mobile banking services, and Mensah
25 *et al.* (2020) on the intention to adopt mobile money transfer among university students. Moreover,
26 according to Hofstede Insights (2020), Vietnam is a collectivist society in which people belong to
27 groups and emphasize group relationships and loyalty. In this study, we observed that Vietnamese
28 migrant workers might prioritize the opinions of groups of Vietnamese migrant workers in Taiwan.
29 It could be a Facebook group in which these workers share experiences of life and job in Taiwan.
30 Therefore, we assume that if users are influenced by positive messages from their social network
31 about mobile remittance apps, they tend to use it to transfer money to home.
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36 *H3: Social influence (SI) is positively associated with the behavioral intention (BI) of mobile*
37 *remittance apps.*
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39 Facilitating conditions (FC) is identified by Venkatesh *et al.* (2003), which is “the degree to
40 which an individual believes that organizational and technical infrastructure exists to support use
41 of the system.” It is characterised by four models: model of PC utilization (MCPU), combined with
42 the technology acceptance model and TPB (C-TAM-TPB), innovation diffusion theory (IDT), and
43 theory of planned behavior (TPB). Venkatesh *et al.* (2003) confirmed that facilitating conditions
44 positively influence user behavior. Existing research has reported similar results by applying
45 UTAUT or an extension of UTAUT for the adoption of information services (McKenna, Tuunanen,
46 & Gardner, 2013), use of mobile banking (Oliveira, Faria, Thomas, & Popovič, 2014), acceptance
47 and use of mobile learning (Chao, 2019), and adoption of smartphones at the bottom of the pyramid
48 (Baishya & Samalia, 2020). In line with the theoretical foundations and relevant studies, FC is
49 expected to affect user behavior.
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52 *H4: Facilitating conditions (FC) are positively associated with mobile remittance app usage*
53 *behavior.*
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3 Perceived cost is defined as the unit cost that a person believes that he or she must pay for using
4 technology products (Chitungo and Munongo 2013). The costs include transaction costs, mobile
5 network data costs, and mobile device costs. Freund and Spatafora (2008) revealed that transaction
6 costs negatively influence remittances. This indicates that the use of formal remittance channels
7 can be increased if transaction costs are reduced. However, Tobbin and Kuwornu (2011) examined
8 the impact of factors on Ghana's customers' behavioral intention toward mobile money transfer
9 and showed that high costs may prevent people from adopting mobile money transfer services.
10 Rind *et al.* (2017) also found that cost was a barrier to the adoption of mobile commerce in Pakistan;
11 an increase in its usage cost would reduce its acceptance. Within the context of mobile banking, a
12 study conducted by Singh and Srivastava (2018) surveyed 855 participants about their intention to
13 accept mobile banking in India and found that the perceived financial cost has a significant impact
14 on users' intentions to use mobile banking. Nevertheless, Le *et al.* (2020) also found that perceived
15 cost negatively impacts the decision to use mobile banking services in Thanh Hoa, Vietnam.
16 Therefore, the following hypothesis is proposed:
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20 *H5: Perceived cost (PC) is negatively associated with the behavioral intention of the mobile*
21 *remittance app.*
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23 Tsiakis and Sthephanides (2005) examined the concept of security and trust in electronic
24 payments and found that security is a set of programs and procedures for customers' information
25 authentication, information privacy pledge, upholding information integrity, and prevention of
26 fraud and financial losses. Oliveira (2017) indicated that perceived security refers to a feeling of
27 security while making a financial transaction using technology. The findings revealed that in
28 technologies involving sensitive and personal data, the capability to secure transactions is relevant
29 and a direct determinant of the customer's intention to adopt the technology. Several studies have
30 suggested that information security is a barrier to the broad adoption of mobile payments (Chang,
31 2014; Tse *et al.*, 2019). Khalilzadeh *et al.* (2017) examined the intention to use mobile payment
32 and discovered that security is the most influential predictor of NFC-based mobile payment usage.
33 Similarly, perceived security has significant positive influence on the adoptions of mobile payment
34 systems (de Luna, Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2019) Teoh, Chong,
35 Lin, and Chua (2013) investigated e-payment adoption, which discovered a link between security
36 and users' perception in using mobile technology service. Conversely, Merhi *et al.* (2019)
37 examined the factors that may prevent or facilitate the acceptance of mobile banking services in a
38 cross-cultural context. The findings indicated that both English and Lebanese consumers were
39 influenced by perceived privacy. The current study anticipated that the security factor is a predictor
40 of consumers' intention to use the mobile remittance app.
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45 *H6: Perceived security (PS) is positively associated with the behavioral intention (BI) of mobile*
46 *remittance apps.*
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48 Venkatesh *et al.* (2003) and Venkatesh, Thong, and Xu (2012) proposed the UTAUT and
49 UTAUT2 models and empirically examined the relationship between behavioral intention and use
50 behavior. They confirmed that behavioral intention explains users' actual use behavior of
51 technology. This relationship has also been tested in many research fields. For example, Arenas-
52 Gaitán, Peral-Peral, and Ramón-Jerónimo (2015) applied the extension of UTAUT model to
53 explain internet banking use of elderlies in Spain. The results indicated that behavioral intention
54 had a positive impact on use behavior in the adoption of Internet banking. Furthermore, Palau-
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3 Saumell, Forgas-Coll, Sánchez-García, and Robres (2019) investigated the user's adoption of
4 mobile apps for restaurants, Hoque and Sorwar (2017) studied the factors influencing the adoption
5 of mHealth, and Warsame and Ileri (2018) examined the intention to use mobile microfinance
6 services in Kenya, discovering that customer intention has a positive effect on usage behavior. In
7 the mobile banking context, Baptista and Oliveira (2015), Bhatiasevi (2016), Raza, Shah, and Ali
8 (2019), and Kwame, Afo, and Charity (2019) proved that BI impacted the actual use of a new
9 technology. Hence, the following hypothesis is proposed:
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12 *H7: Behavioral intention is positively associated with usage behavior of mobile remittance apps.*

13 14 2.3 Mobile remittance process and the market in Taiwan.

15 A mobile remittance app operates on a mobile device and is available for download from Google
16 Play Store and AppStore. The functions include authentication of the users, storage of transaction
17 history, transaction making, storage of recipients' information (address, ID number, bank account,
18 or other payment instrument) promotion voucher, and notification. To transfer money through
19 applications, senders need to sign up and provide a customer's identity document. As the remittance
20 service provider approves the application, customers can start making transactions in the app. Most
21 remittance applications provide three payout options: cash pickup, deposit to bank account, and
22 home delivery of cash (Fig. 3). The receiver's information is required based on the type of payout.
23 Senders can choose to pay convenience stores, with whom service providers cooperate in Taiwan.
24 The steps to make a transaction include selecting the receiver, selecting the convenience store to
25 pay, selecting the amount of money to remit, confirming transactions, and paying at the
26 convenience store by scanning barcodes or QR codes. After the sender pays successfully, a
27 notification is sent to the app. The sender only needs to wait for the money to be transferred to the
28 receiver. It takes 2–24 hours to transfer money to the bank account of the beneficiary, 1–2 days for
29 cash pickup option, and 2–3 days for home delivery of cash. The handling fee is set at NTD \$150
30 (USD \$5) to NTD \$300 (USD \$10), down from the NTD \$400 (USD \$13) charged by banks.
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35 <<Figure 3 The mobile remittance process>>
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39 Pre-COVID Taiwan has emerged as a major destination country for foreign workers due to job
40 opportunities. According to statistics from the Ministry of Labor in January 2020, the total number
41 of migrant workers in Taiwan at the end of 2019 surpassed 718,058, which is an increase of 2.17
42 percent compared to the same period of 2018. The top three nationalities currently working in
43 Taiwan in the order of population numbers are Indonesians at 276,411 (39 percent), Vietnamese at
44 224,713 (31 percent), and Filipinos at 157,487 (22 percent) (Ministry of Labor Republic of China,
45 2020). Before the pandemic struck foreign workers in Taiwan remitted USD \$3 million through
46 formal channels in 2017. Migrant workers can remit money through banks and remittance service
47 operators, such as the Western Union. The transaction cost ranges from approximately NTD \$200
48 (USD \$7) to NTD \$800 (USD \$27) depending on the amount of money and destination, and the
49 transfer time is supposed to be 1–3 working days. In January 2018, Taiwan's Legislative Yuan
50 approved the *Financial Technology Innovative Experimentation Act* (FTIEA). According to the
51 Financial Supervisory Commission (FSC), the Act aims to encourage innovation and develop
52 domestic financial technology (Fintech), create a positive environment, and enhance the
53 competitiveness of domestic financial industries. On January 31, 2019, the first two applicants in
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3 the cross-border remittance area were passed by the FSC. Two companies (Eastern Union
4 Interactive and Welldone Company) would provide mobile remittance applications that allow
5 foreign workers from Indonesia, Vietnam, Thailand, and the Philippines remitting money to their
6 home country by making transactions in the app and paying at convenience stores (Financial
7 Supervisory Commission, 2019), such as Vietmoney (Eastern Union Interactive) and QPay
8 (Welldone company). In particular, the Vietmoney app is only for the use of Vietnamese migrant
9 workers in Taiwan; notably, Vietmoney is a leading company in the remittance industry in Taiwan.
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12 Moreover, the outbreak of COVID-19 also impacts mobile payment and money transfer in
13 Taiwan, which started mobile payment services in 2016. According to Taiwan News in 2020 and
14 2021, mobile payments generated US\$4.18 billion of first seven months of 2020 which
15 represents 156% year-on-year. Particularly, over 75% of consumers have increased the use
16 of mobile payments to June 2021, while the penetration rate of mobile payments was 62.2%
17 in 2019 and 13% in 2018. People turn to contactless payment to reduce risk during the
18 spread of COVID-19. E-payment transactions rose 3.18 times in 2020 compared to 2019 in
19 Taiwan (Kao, 2020). In Taiwan, mobile money transfer was initiated from mobile peer-to-peer
20 intrabank/interbank transfer in 2018 and evolved to interbank electronic money transfer via mobile
21 phone number in 2020. The government also launched that transferring money between bank
22 accounts mobile/online will be free of charge during the period of level-3 COVID alert in
23 May of 2021. In 2019, two companies (Welldone Co. and EMQ Ltd.) formally obtained
24 licenses of money transfer service in 2019 for foreign workers. Many innovative mobile
25 remittance applications emerged in Taiwanese market such as King's Pay, SET, FastPay,
26 QuickPay, Indopay, and etc. and also worked with convenience stores to achieve two-way
27 transfer. The mobile remittance opportunities in Taiwan for 7.11 hundred thousand migrant
28 workers (by the end of May 2021) becomes critical and important.
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32 **3. Research Method**

33 *3.1 Sampling method*

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35 The population sample used in this research was Vietnamese mobile remittance workers in
36 Taiwan. While target users of mobile remittance applications are migrant workers in Taiwan,
37 Vietnamese migrant workers accounted for the second largest share of the foreign laborer
38 population at 31 percent, ranked only after Indonesia based on a report from the Ministry of Labor
39 Republic of China (2020). Several sampling techniques are classified into two groups: (1)
40 probability sampling or representative sampling and (2) non-probability sampling or judgmental
41 sampling (Benzo *et al.*, 2017). With probability samples, the probability of any one individual
42 being selected from the target population (sample) is known and is usually equal for all respondents.
43 Therefore, this study used non-probability sampling to collect data using an online questionnaire.
44 This technique to select units in a sample is much easier, quicker, and robust than probability
45 sampling.
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49 *3.2 Instrument and data collection*

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51 The questionnaire consisted of two parts. The first part of the questions covers the customers'
52 perceptions regarding factors that may impact the users' intention and usage behavior of mobile
53 remittances and the most common application used by them. The second part focuses on
54 demographic characteristics, including age, gender, and experience. We modified the original
55 UTAUT model by removing volunteers of use since users employ mobile phones every day, and
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the use of mobile remittance applications is voluntary. To ensure that data were solid, we asked respondents to provide their telephone numbers. For the measurement of each construct and behavioral intention, certain items were adapted from previous studies in the technology acceptance field. The items and scales for the four constructs of the UTAUT model were adapted from the study of Venkatesh *et al.* (2003). The perceived cost of mobile remittance transactions is measured using four items adapted from Yu (2012), and four items of perceived security is adapted from Cheng, Lam, and Yeung (2006) (as shown in Table 1).

To measure the respondents' responses on items of UTAUT constructs and two additional constructs, a five-point Likert scale was used, ranging from strongly disagree (1) to strongly agree (5). The participants were also allowed to express a neutral response and help reduce possible confusion and complexity (Chemingui, 2013). The questionnaire was first developed in English. Because all respondents were Vietnamese, the questionnaire was translated from English to Vietnamese by a professional native to ensure the full comprehensibility of the questions. Prior to publishing the survey, 20 participants were pre-tested to obtain feedback on the spelling, grammar, and clarity of the questions, as well as to identify misunderstandings and ambiguities. The questionnaire was conducted online using Google Forms. Bocarnea (2012) suggests that online surveys are accessible to anyone with Internet access. They also reduce the coding time and lower the publication and distribution costs. A social network was used as a starting point for the distribution of the survey link. The survey was distributed through posts linked to Facebook groups of Vietnamese migrant workers in Taiwan.

The steps to collect data on Facebook include joining Vietnamese community groups in Taiwan and posting the link of the survey after administrative approval. Three major Facebook community groups were selected: Ăn chơi Đài Loan (27.1K members), Hội chuyên chủ tại Đài Loan (27K members), and Người Việt Nam ở Đài loan (221.4K members). The posted time was between August 8 and 25, 2020, and ended on October 2, 2020. We also asked for permission from the Eastern Union Interactive to distribute the survey to its users. After receiving approval from the manager, we directly contacted Vietmoney's customers through the Vietmoney fan page and official Vietmoney LINE account (instant messenger). Whenever customers contacted Vietmoney (through Facebook/LINE) for help, the staff asked them to fill in the survey after helping them answer and solve any problems related to their services. The data collection period was between August 16 and October 4, 2020. The Vietmoney fan page included 46177 followers and 9411 friends on the official LINE account. Finally, we ask for the permission from volunteers of mobile remittance application users and the final sample comprised 344 valid responses.

Table 1 Summary of Measurement Items

4. Findings

4.1 Demographics

This research distributed an online questionnaire from 30 July to October 4, 2020, and a total of 344 usable responses were received online. Table 2 provides an overview of the respondents' demographic characteristics. The results showed that 55.2% were men and 44.8% were women. Most of the respondents were in the age group of 25–35 years old (64.8%), followed by 18–24 years old (18%), whereas 17.2% of the respondents were 36–50 years old, and those older than 50 years received no vote. Of the 344 respondents, 209 respondents were married (60.8%) and 135

were single (39.2%). Moreover, the majority of respondents (88.7%) had a high school level education or below, with 305 respondents. 24 respondents obtained a bachelor's degree (7%), while the remaining 15 respondents obtained a master's degree or above (4.4%).

In terms of money transfer channels, 48.5% of respondents previously used banks, which were the most commonly used channels to send money to Vietnam, 38.1% sent money to Vietnamese shops, 9.9% of respondents sent money to home through friends and middlemen, and 3.5% sent money through money transfer operators. The results show that banks were the most commonly used channels that respondents used to transfer money before using mobile remittance applications. The data also indicate that a large number of respondents (43%) have used mobile remittance applications for six to twelve months, followed by those using applications for less than six months. Regarding the most commonly used application, Vietmoney application received the most votes from respondents (61%), followed by Qpay application (31.1%) and EMQ application (4.4%). The results also confirmed that Vietmoney and QPay are two major mobile applications for Vietnamese migrant workers to transfer money from Taiwan to their home country.

Table 2 Demographics

4.2 Reliability

To ensure the internal consistency of the seven constructs, a reliability test was conducted. Cronbach's alpha is the most frequently used measure to assess the internal consistency of a given construct. If the values of Cronbach's alpha are higher than 0.70, the values are considered acceptable (Nunnally, 1994). Cronbach's alpha values of all constructs were satisfied with the standard value of 0.7 (Table 3); therefore, they had good internal consistency, and the questionnaire was highly reliable.

Table 3 Results of Cronbach's alpha

4.3 Exploratory Factor Analysis

Exploratory factor analysis (EFA) can be used to uncover appropriate variables and identify the relationships between large numbers of variables. KMO sampling adequacy and Bartlett's sphericity tests were conducted. The results show that the KMO index was 0.868, which is well above the recommended value of 0.6. Moreover, the significance value of Bartlett's test was 0.000, which was less than 0.05. The EFA was conducted using principal component analysis and the promax method. According to Nunnally (1978) and Hair, Black, Babin, Anderson, and Tatham (1998), factor loading should be greater than 0.5, and the total variance explained must be over 50% (Gerbing & Anderson, 1988). Table 4.4 shows that the total variance explained was 78.1% (> 50%), which proves the appropriateness of the factor analysis. This reveals that the seven-factor solution explained 78.1% of the variation among the surveyed items. Furthermore, the factor loadings of all items were greater than 0.5, which confirms the existence of convergent and discriminant validity (Table 4).

Table 4 Factor loading- Rotated component matrix

4.4 Validity

In this study, confirmatory factor analysis (CFA) was conducted to test the convergent and discriminant validity. Convergent validity was assessed using the average variance extracted (AVE) values for all indicators of each construct. According to Fornell and Larcker (1981), the average variance extracted value of equal to or greater than 0.5 indicates acceptable convergent validity, suggesting that the unobserved construct accounts for more than 50% of the variance of the indicators. As shown in Table 4.6, all AVE values were above 0.5, indicating satisfactory convergent validity.

Table 5 Results of validity tests

Discriminant validity was evaluated by comparing the square root of the average variance extracted (AVE) with the correlation of latent constructs (Fornell & Larcker, 1981). Table 5 shows that the square roots of the AVE of each latent factor, which are between 0.769 and 0.922, were greater than the correlations with other latent constructs. This indicates that each construct better explains the variance of its items than the variance of the other constructs.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.664 ^a	0.441	0.433	0.44249	2.001

a Predictors: (Constant), PS, PC, SI, EE, PE

b Dependent Variable: BI

The Durbin-Watson statistic for the model was 2.001 indicating there was independence of residuals. The computed R square was 0.441 which means that more than 44% of the variance in the intention to use mobile remittance application was explained by the five independent constructs.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.372	0.273		5.028	0.000		
1 PE	0.339	0.046	0.334	7.324	0.000	0.794	1.259
EE	0.203	0.044	0.206	4.635	0.000	0.838	1.193
SI	0.07	0.042	0.075	1.664	0.097	0.812	1.231
PC	-0.164	0.03	-0.23	-5.411	0.000	0.913	1.095
PS	0.192	0.042	0.198	4.583	0.000	0.885	1.13

a. Dependent Variable: BI

The VIF of all variables was smaller than 2 which indicate no evidence of multi-collinearity between the variables of the study.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	9.026	30.086	30.086	9.026	30.086	30.086	4.633
2	3.032	10.106	40.192	3.032	10.106	40.192	5.074
3	2.857	9.524	49.716	2.857	9.524	49.716	4.679
4	2.224	7.412	57.128	2.224	7.412	57.128	4.202
5	1.981	6.603	63.731	1.981	6.603	63.731	5.063
6	1.872	6.242	69.973	1.872	6.242	69.973	5.173
7	1.435	4.784	74.757	1.435	4.784	74.757	6.221
8	1.016	3.388	78.145	1.016	3.388	78.145	3.439
9	.612	2.040	80.185				
10	.574	1.915	82.100				
11	.555	1.851	83.951				
12	.507	1.690	85.641				
13	.426	1.421	87.062				
14	.408	1.359	88.421				
15	.386	1.285	89.706				
16	.335	1.117	90.823				
17	.304	1.014	91.836				
18	.285	.948	92.785				
19	.269	.896	93.681				
20	.246	.819	94.500				
21	.232	.772	95.273				
22	.208	.693	95.966				
23	.191	.636	96.603				
24	.186	.619	97.221				
25	.181	.602	97.823				
26	.169	.562	98.386				
27	.142	.473	98.859				
28	.135	.448	99.308				
29	.122	.405	99.713				
30	.086	.287	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

The total variance explained was 78.1% (> 50%), which proves the appropriateness of factor analysis. The result shows total variance extracted is 30.086% which presents no common method bias in this study. In addition, all significant values of the correlation between ABSRES and the independent variables are greater than 0.05 which shows null heteroscedasticity.

4.5 Multiple regression analysis

A Durbin-Watson test was run to test for autocorrelation in the residuals from a statistical regression analysis. According to Montgomery *et al.* (2012), the value of Durbin-Watson can range from 0 to 4; a value of approximately 2 indicates relatively less correlation between residuals, and values closer to 0 or 4 indicate a greater, positive, or negative autocorrelation, respectively. The result suggests that the Durbin-Watson statistic for the model was 2.001, indicating that residuals were independent. The computed R-square was 0.441, implying that more than 44% of the variance in the intention to use mobile remittance application was explained by the five independent constructs. The results of the ANOVA test show that the significance regression equation was constructed as $F(5, 338) = 53.314, p < .001$. Since the P-value is less than the α value ($0.000 < 0.05$), the model was fit to the analysis.

Table 6 presents the outcomes of multiple regression analysis. Performance expectancy ($p < 0.05$), effort expectancy ($p < 0.05$), perceived cost ($p < 0.05$), and perceived security ($p < 0.05$) had a significant effect on behavioral intention toward mobile remittance applications, while social influence ($p > 0.05$) had no impact on the intention to use mobile remittance applications. The β value represents the regression coefficient that measured a unit change in the dependent variable when the independent variable changed. In addition, the greater the β value, the greater the impact of the independent variable on the dependent variable. By comparing the β -value of five independent variables, it was shown that performance expectancy ($\beta = 0.334$) had the greatest influence on behavioral intention, while perceived cost had a negative coefficient of -0.23. Effort expectancy and perceived security had positive coefficients of 0.206 and 0.198, respectively. Moreover, the VIF of all variables was less than 2, indicating no evidence of multicollinearity between the variables of the study. In conclusion, this finding confirmed hypotheses H1, H2, H5, and H6, while H3 was not supported.

Table 6 Regression analysis results for dependent variable of behavioral intention

The second multiple regression test was performed to test hypotheses H4 and H7. The results are presented in Table 7. The computed R-square was 0.187, indicating that approximately 19% of the variance in the usage behavior of mobile remittance applications was explained by behavioral intention and facilitating conditions. Behavioral intention ($\beta = 0.429, p < 0.05$) had a significant positive impact on the usage behavior of mobile remittance applications, while the p-value of the facilitating condition was greater than 0.05, indicating that facilitating conditions had no impact on usage behavior. This suggests that only H7 was confirmed. Hence, the statistical results confirmed five of the seven hypotheses in the proposed model.

Table 7 Regression analysis results for dependent variable of use behavior

4.6 Discussion

This study focused on examining factors of intention and use behavior of mobile remittance applications in Taiwan by combining UTAUT with two additional constructs (perceived cost and perceived security), as shown in Fig. 4. The findings are consistent with research by Venkatesh *et al.* (2003), Baptista and Oliveira (2015), Basri (2018), Savic and Pešterac (2019), Mensah *et al.* (2020), and Gunawan, Sinaga, and Wp (2019). Performance expectancy is the most important predictor of the intention to use mobile remittances. This result is in line with the studies of Kang (2019) on mobile payment, Baptista and Oliveira (2015) and Merhi *et al.* (2019) on mobile banking, and Ayaz and Yanartaş (2020) on the acceptance of electronic document management systems. This indicates that users in all contexts chose to use new technologies because of their usefulness and convenience. In the mobile remittance context in Taiwan, users do not need to be concerned about the service hours of banks, the language barrier, or the risk of illegal money transfer.

Moreover, most users have a high school level education or below; therefore, if they feel that the application is easy to use, they will adopt it. Perceived cost also plays a vital role in the adoption of mobile remittances. If service providers deliver applications that are compatible with all devices and offer a low transaction fee, more users tend to use the applications. In addition, perceived security positively impacted the intention to use mobile remittances. This indicates that service providers should pay attention to protecting users' transactions and personal information. However, the results revealed that social influence had no significant influence on behavioral intention to adopt mobile remittance applications. This is similar to the studies of Wang and Yi (2012) and Baptista and Oliveira (2015), who argued that social influence has no significant influence on the intention to adopt m-payment and mobile banking; however, the results failed to support cultural influence, namely collectivism. In a collectivist society like Vietnam, people are normally more concerned about the opinions of others (Hofstede Insights, 2020). In addition, mobile banks and mobile payments are now quite popular in Vietnam, with more than 30 non-bank payment organizations offering around 20 e-wallets, according to Nikkei Asia (2019). Users become rational and focus more on experience, rather than on external opinions. Therefore, social influence does not significantly influence the intention to use.

The results showed that facilitating conditions did not significantly influence behavioral intention in mobile remittance applications. This finding was consistent with research by Hoque and Sorwar (2017) and Macedo (2017), which indicated that facilitating conditions have an insignificant impact on use behavior. This implies that consumers may have the resources and knowledge necessary to use mobile remittance applications and may not consider support to be important while using mobile remittance applications. Moreover, the results showed that most of the respondents were young adults (18% of respondents were in the 18–24 age group and 64.8% of respondents in the 25–35 group) who consider themselves more knowledgeable about technologies. Further, the Internet increases their awareness about technological developments (Sieber & Sabatier, 2003). Therefore, users may easily employ mobile remittance applications without the help of others.

Figure 4 Results of the proposed model

Furthermore, this study adopted two demographic moderators: gender and age. The original UTAUT model was modified by removing experience and volunteering to use mobile phones every day. We tested their moderating roles, impacting the relationships between independent variables and the dependent variable. The results showed that both gender and age had no significant

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3 influence as moderators. The results were similar to studies conducted by Martins, Oliveira, and
4 Popovič (2014) and Mohan, Heinhuis, and van Engers (2013), confirming no significant
5 moderation effect by both gender and age.
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7 **5. Implications**

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9 The remittance industry was transformed after Taiwan's government approved the Financial
10 Technology Innovative Experimentation Act in 2018. Now, migrant workers in Taiwan can send
11 money to their home countries through different money transfer channels. In addition to traditional
12 money transfer methods such as banks and operators, some non-financial organizations have
13 launched mobile remittance applications that allow migrant workers to remit money faster and
14 cheaper. As Taiwan is a potential and emerging market for mobile remittance, the results of the
15 current study provide a better understanding of customers' preferences in adopting mobile
16 remittance applications. From a theoretical perspective, this study attempted to discover the factors
17 impacting the intention and behavior of users of mobile remittance applications by extending the
18 UTAUT model. The results revealed that the proposed model provides sufficient explanatory
19 power to predict the determinants of behavioral intention toward mobile remittance. The proposed
20 model can be applied and tested in other markets to gain a better insight into mobile remittance
21 acceptance behavior. Moreover, this study enriches the mobile remittance literature in the context
22 of Asian countries with migrant workers and provides a direction to scholars to explore important
23 factors of mobile remittance applications in the future.
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27 From a managerial perspective, the findings have several implications for mobile remittance
28 service providers to boost the pace of technology adoption in Taiwan. First, the findings revealed
29 that performance expectancy was the most influential predictor of the behavioral intention of
30 mobile remittances. Mobile remittance service providers should design more convenient and
31 effective applications to save time of money transfer via modern technologies, such as adding
32 payment functions that allow users to transfer money to providers' bank accounts, instead of paying
33 at convenience stores. Second, the layout of a mobile remittance application has a significant
34 impact on user acceptance. The user interface of applications should be clear, and transaction
35 procedures should be simple with less effort. Third, a reasonable service fee and promotions will
36 help attract users and increase their intention to use applications. Fourth, transactional and personal
37 data breaches and leakage could be barriers to the adoption of mobile remittance applications. Thus,
38 application providers should guarantee the highest level of security and safety in the context of
39 mobile remittances. The current study provides clues to companies in the context of mobile
40 remittances in Taiwan. The acknowledgement of factors impacting mobile remittance acceptance
41 could help mobile remittance providers build strategies for customer awareness engagement and
42 application development.
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46 **6. Limitations**

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48 This research helps emphasize crucial factors that impact intention and usage behavior in the
49 context of mobile remittances, but the limitations should be acknowledged. The samples of the
50 current study comprise mobile remittance application users, which helps draw conclusions about
51 motivations to use the technology but not about the reason that individuals tend to avoid its
52 adoption. Future research should conduct studies combining users and non-users of mobile
53 remittance to determine the influence of different factors on both groups. This study is limited to
54 Vietnamese mobile remittance application users in Taiwan during the pandemic, and the results
55 are discussed in this cultural context. Hence, the influential factors in other settings and cultures
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3 must be explored. This study extends the UTAUT model by adding perceived cost and perceived
4 security factors; more factors that affect the acceptance of mobile remittance applications could be
5 developed and tested in the future.
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7. Conclusion

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9 During the pandemic, migrant workers have experienced enormous pressure, uncertain labor
10 conditions, and stress of being the providers of livelihood to their families abroad (Global Crisis
11 Center, 2020). However, the adverse economic conditions inflicted by COVID are decreasing the
12 volume of cross-border mobile money transfers. In addition to affecting the dependents of the
13 migrant works and recipients of financial help, this downward trend is also expected to drive down
14 the mobile payment industry revenue. The losses are predicted (Girancourt *et al.*, 2019) to reach
15 billions, while scholars concur that the acceptance of mobile money transfer technology requires
16 further attention. Previous research examined the factors that impact the adoption of mobile
17 banking, mobile money transfer, and mobile payment. However, there is a lack of studies in the
18 COVID context investigating the intention to use remittance applications for migrant workers. This
19 research—which proposed a model by adopting the UTAUT model—contributed to the literature
20 by adding two additional constructs: perceived cost and perceived security. The findings revealed
21 that performance expectancy, perceived security, effort expectancy, and perceived cost had a
22 significant impact on adoption intention. However, social influence was confirmed to have an
23 insignificant effect on users' behavioral intentions, and there was no influence between facilitating
24 conditions and user behavior. Moreover, the results also showed that performance expectancy was
25 the most crucial determinant of the intention to use mobile remittances.
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29 The major contributions of this study are as follows. First, the study demonstrated that the two
30 additional constructs significantly influenced users' intention to accept mobile remittance
31 applications. The results will be useful to researchers in further developing and refining mobile
32 remittance research models. Second, the findings provide a direction for mobile remittance
33 application developers to understand customers' preferences. After obtaining influential factors,
34 mobile remittance service providers could build their strategies, thus helping in enhancing the pace
35 of adoption. For example, the study indicated the importance of usefulness; thus, service providers
36 can apply advanced technologies and upgrade their services with more innovative functions to
37 enhance the convenience and usefulness of the service system. The study also emphasises that
38 effort expectancy plays a vital role in determining customer intentions. It is necessary to enhance
39 the application design to build a user-friendly interface. Furthermore, it should be ensured that the
40 application is a simple, mobile money transfer application, which offers convenience to migrant
41 workers abroad, thereby easing the burden of working away from their home countries.
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Table 1 Summary of Measurement Items

Constructs	Items	Sources
Performance Expectancy (PE)	PE1	Mobile remittance is useful to transfer money to Vietnam
	PE2	Using mobile remittance would enable me to accomplish tasks more quickly
	PE3	Using mobile remittance would increase my productivity
	PE4	Using mobile remittance would save my time
Effort expectancy (EE)	EE1	My interaction with mobile remittance would be clear and understandable
	EE2	It would be easy for me to become skillful at using mobile remittance
	EE3	I would find mobile remittance easy to use
	EE4	Learning to operate mobile remittance would be easy for me
Social influence (SI)	SI1	People who influence my behavior think that I should use mobile remittance
	SI2	People who are important to me think that I should use mobile remittance
	SI3	My co-workers would encourage me to use mobile remittance
	SI4	The organization has supported the use of mobile remittance
Facilitating conditions (FC)	FC1	I have the resources necessary to use mobile remittance
	FC2	I have the knowledge necessary to use mobile remittance
	FC3	Mobile remittance is compatible with other applications I use
	FC4	I can get help from others when I have difficulties using mobile remittance
Perceived cost (PC)	PC1	I think the cost of using mobile remittance is expensive
	PC2	The wireless link fee is expensive when using mobile remittance
	PC3	The mobile device setup for using mobile remittance charges me lot of money
	PC4	Using mobile remittance is cost burden to me
Perceived security (PS)	PS1	I would feel secure sending sensitive information across mobile remittance
	PS2	Mobile remittance platforms are secure for sending sensitive information
	PS3	I would feel safe providing sensitive information about myself over mobile remittance
	PS4	Overall, the mobile remittance is a safe place to transmit sensitive information

Venkatesh,
Morris, Davis,
and Davis (2003)

Yu (2012)

Cheng, Lam, and
Yeung (2006)

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Behavioral intention (BI)	BI1	I intend to use mobile remittance in the next months	Venkatesh, Morris, Davis, and Davis (2003;2012)
	BI2	I predict I would use mobile remittance in the next months.	
	BI3	I plan to use mobile remittance in the next months.	
Use behavior (UB)	UB1	Please choose your usage frequency for bank-to-bank service	
	UB2	Please choose your usage frequency for counter pick-up service	
	UB3	Please choose your usage frequency for door-to-door service	

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Table 2 Demographics

Demographic	Frequency	%
Gender	Male	190 55.2
	Female	154 44.8
Age	18–24 years old	62 18
	25–35 years old	223 64.8
	36–50 years old	59 17.2
	Above 50 years old	0 0
Marital status	Married	209 60.8
	Single	135 39.2
Education	High school or below	305 88.7
	Bachelor's Degree	24 7
	Master's Degree or above	15 4.4
Income	Less than 25,000 NTD	113 32.8
	25,000–35,000 NTD	190 55.2
	35,000–45,000 NTD	32 9.3
	More than 45,000 NTD	9 2.6
What were the most commonly used channels to send remittance before?	Bank	167 48.5
	Money transfer operator	12 3.5
	Friends and middleman	34 9.9
	Vietnamese shops	131 38.1
	Less than 6 months	101 29.4
How long have you been using remittance application?	6–12 months	148 43
	More than 12 months	95 27.6
What is the most commonly used remittance application?	Vietmoney	210 61
	Qpay	107 31.1
	EMQ	15 4.4
	Vnex	4 1.2
	SET	7 2
	Other	1 0.3

Table 3 Results of Cronbach's alpha

Constructs	Cronbach's Alpha	N of Items
Performance expectancy	0.89	4
Effort expectancy	0.89	4
Social influence	0.90	4
Facilitating conditions	0.85	4
Perceived cost	0.89	4
Perceived security	0.93	4
Behavioral intention	0.94	3
Use Behavior	0.79	3

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Pattern Matrix^a

	Component							
	1	2	3	4	5	6	7	8
PS4	.924							
PS2	.917							
PS3	.917							
PS1	.867							
SI2		.914						
SI1		.881						
SI3		.877						
SI4		.815						
EE3			.886					
EE4			.871					
EE2			.861					
EE1			.858					
PC4				.917				
PC1				.884				
PC3				.860				
PC2				.825				
PE4					.886			
PE3					.854			
PE1					.840			
PE2					.839			
FC1						.971		
FC2						.885		
FC4						.706		
FC3						.686		
BI2							.978	
BI1							.946	
BI3							.879	
UB2								.882
UB3								.876
UB1								.716

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

uple

Table 5 Results of validity tests

	Convergent validity		Discriminant validity						
	AVE	BI	PE	EE	SI	FC	PC	PS	UB
BI	0.851	0.922							
PE	0.646	0.572	0.804						
EE	0.683	0.409	0.256	0.826					
SI	0.694	0.348	0.347	0.396	0.833				
FC	0.613	0.434	0.359	0.382	0.480	0.783			
PC	0.679	-0.419	-0.307	-0.165	-0.174	-0.201	0.824		
PS	0.761	0.393	0.334	0.248	0.211	0.329	-0.094	0.872	
UB	0.592	0.529	0.287	0.222	0.351	0.206	-0.334	0.236	0.769

Table 6 Regression analysis results for dependent variable of behavioral intention

		Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
	(Constant)	1.372	0.273		5.028	0.000		
	PE	0.339	0.046	0.334	7.324	0.000	0.794	1.259
	EE	0.203	0.044	0.206	4.635	0.000	0.838	1.193
1	SI	0.07	0.042	0.075	1.664	0.097	0.812	1.231
	PC	-0.164	0.03	-0.23	-5.411	0.000	0.913	1.095
	PS	0.192	0.042	0.198	4.583	0.000	0.885	1.13
Model Summary ^b								
Model	R Square	Adjusted R Square						
1	0.441	0.433						

a. Dependent Variable: BI

b. Predictors: (Constant), PS, PC, SI, EE, PE

Table 7 Regression analysis results for dependent variable of use behavior

del		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
	(Constant)	2.151	0.238		9.029	0.000		
1	FC	0.007	0.056	0.007	0.125	0.900	0.806	1.241
	BI	0.39	0.049	0.429	7.892	0.000	0.806	1.241
Model Summary^b								
Model	R Square	Adjusted R Square						
1	0.187	0.182						

a. Dependent Variable: UB

b. Predictors: (Constant), BI, FC

Table 6a Regression with moderators

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
3	(Constant)	2.224	0.201		11.085	0.000		
	PE	0.537	0.047	0.53	11.439	0.000	0.989	1.011
	Gender	-0.077	0.054	-0.065	-1.414	0.158	0.999	1.001
	c.PE.Gender	0.074	0.095	0.036	0.777	0.438	0.99	1.01
3	(Constant)	2.163	0.21		10.306	0.000		
	PE	0.531	0.047	0.524	11.332	0.000	0.999	1.001
	Age	-0.012	0.046	-0.013	-0.272	0.786	0.994	1.006
	c.PE.Age	-0.035	0.081	-0.02	-0.428	0.669	0.995	1.005
3	(Constant)	2.721	0.227		11.994	0.000		
	EE	0.38	0.05	0.386	7.656	0.000	0.984	1.016
	Gender	-0.03	0.059	-0.026	-0.511	0.609	0.997	1.003
	c.EE.Gender	-0.022	0.099	-0.011	-0.226	0.821	0.987	1.014
3	(Constant)	2.614	0.239		10.948	0.000		
	EE	0.384	0.05	0.39	7.74	0.000	0.984	1.016
	Age	0.023	0.05	0.023	0.453	0.651	0.985	1.015
	c.EE.Age	-0.061	0.076	-0.04	-0.809	0.419	0.999	1.001
3	(Constant)	3.219	0.196		16.431	0.000		
	SI	0.304	0.048	0.325	6.341	0.000	0.996	1.005
	Gender	-0.069	0.06	-0.059	-1.146	0.253	0.998	1.002
	c.SI.Gender	-0.066	0.097	-0.035	-0.683	0.495	0.997	1.003
3	(Constant)	3.144	0.21		14.993	0.000		
	SI	0.303	0.048	0.324	6.329	0.000	0.997	1.003

	Age	-0.012	0.051	-0.013	-0.245	0.807	0.993	1.007
	c.SI.Age	-0.149	0.092	-0.083	-1.623	0.105	0.996	1.004
	(Constant)	4.965	0.123		40.263	0.000		
	PC	-0.276	0.036	-0.388	-7.745	0.000	0.992	1.008
3	Gender	-0.071	0.059	-0.061	-1.212	0.226	0.999	1.001
	c.PC.Gender	-0.077	0.072	-0.053	-1.062	0.289	0.994	1.006
	(Constant)	4.91	0.133		37.049	0.000		
	PC	-0.272	0.036	-0.383	-7.668	0.000	0.999	1.001
3	Age	-0.029	0.05	-0.029	-0.574	0.566	0.991	1.009
	c.PC.Age	-0.078	0.058	-0.067	-1.338	0.182	0.992	1.008
	(Constant)	2.763	0.227		12.168	0.000		
	PS	0.369	0.049	0.379	7.452	0.000	0.972	1.029
3	Gender	-0.051	0.059	-0.043	-0.86	0.390	1	1
	c.PS.Gender	-0.064	0.098	-0.034	-0.659	0.510	0.972	1.029
	(Constant)	2.786	0.225		12.363	0.000		
	PS	0.366	0.049	0.376	7.482	0.000	0.997	1.003
3	Age	-0.043	0.05	-0.043	-0.857	0.392	0.995	1.005
	c.PS.Age	0.007	0.079	0.004	0.084	0.933	0.997	1.003

a. Dependent Variable: BI

	(Constant)	2.399	0.325		7.379	0.000		
	FC	0.36	0.072	0.262	5.013	0.000	0.997	1.003
3	Age	0.051	0.062	0.043	0.826	0.409	0.996	1.004
	c.FC.Age	-0.043	0.121	-0.019	-0.354	0.724	0.994	1.006

a. Dependent Variable: UB

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Figure 1. Figure 1 UTAUT model (Source: Venkatesh *et al.* 2003)

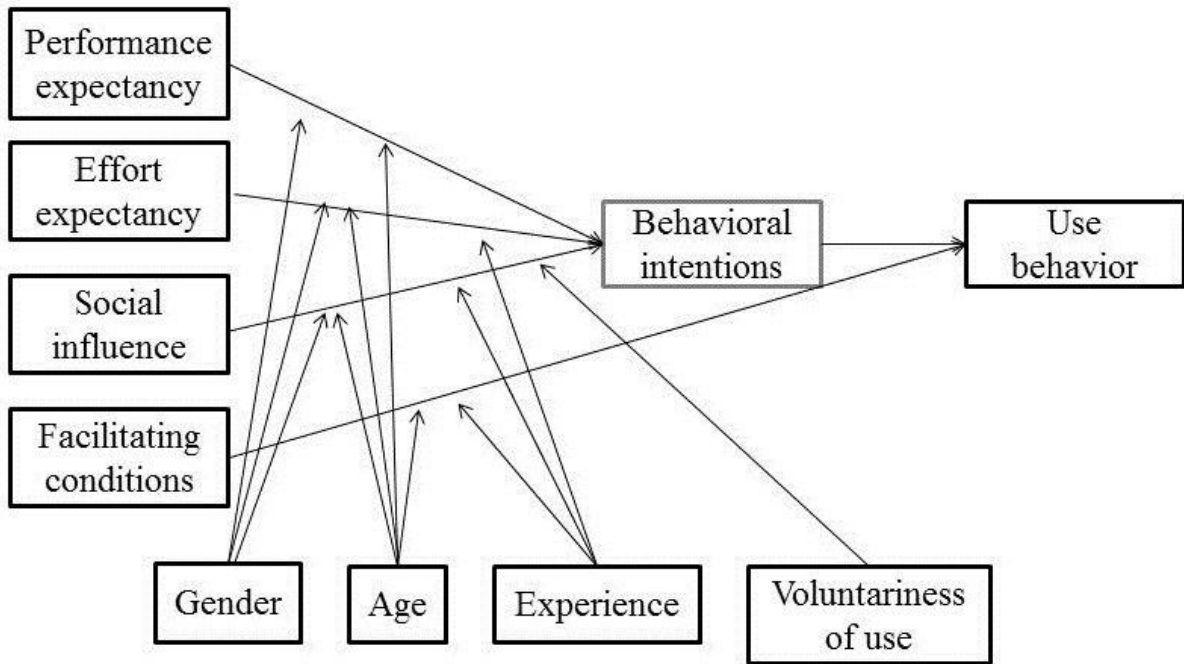
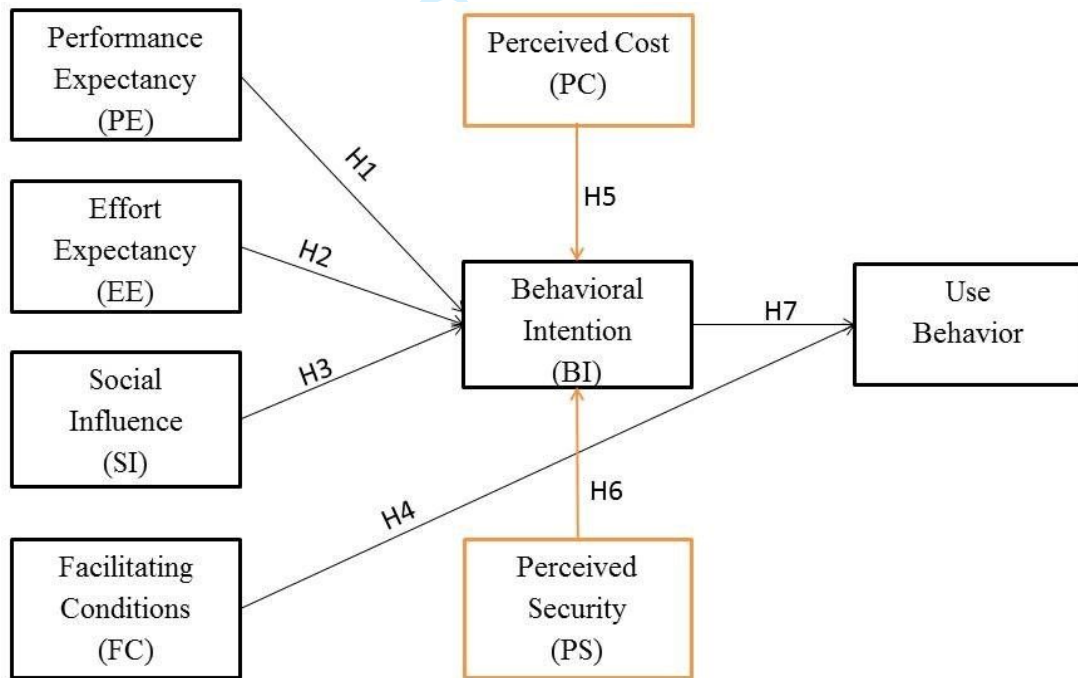


Figure 2. Research model



people

Figure 3. The mobile remittance process

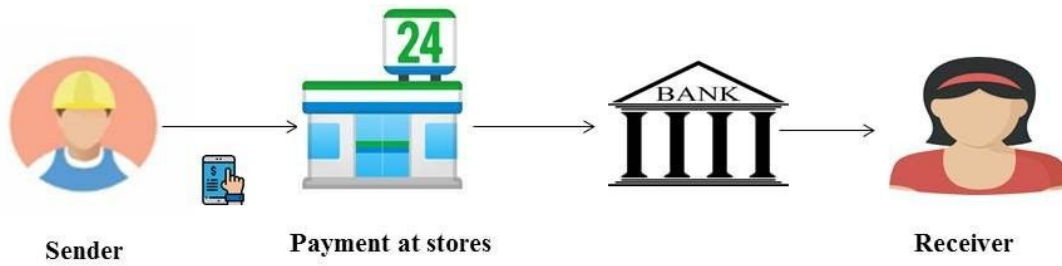


Figure 4. Results of the proposed model

