EXPLORING THE MODERATING EFFECT OF GOVERNMENT SUPPORT ON ACTUAL ADOPTION OF E-WALLET AMONG MOBILE PHONE USERS IN MALAYSIA

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A final year project submitted in partial fulfilment of the requirements for the degree of

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DECLARATION

We hereby declare that:

(1) This undergraduate FYP is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the FYP.

(4) The word count of this research report is 8993 words.

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Last but not least, we also wish to express our sincere thanks to our family members, friends, course mates, and all the respondents that have participated in our survey. Their selfless supports are gratefully acknowledged, together with the sincere apologies to those we have unintentionally failed to mention here.

DEDICATION

This study is dedicated to Universiti Tunku Abdul Rahman (UTAR) for providing us a platform and opportunity to utilize and apply the knowledge that we have learned in financial economics courses throughout the time.

Furthermore, we would like to dedicate this thesis to our final year project supervisor, Dr. Go You How. He has showed a great support and motivation throughout the process of this study. Besides that, he was compassionate in sharing the knowledge while doing the research with us. Without our most respected supervisor, we might not be able to complete this thesis on time. Next, we would like to dedicate to our examiner, Dr. Yiew Thian Hee. He has provided us some proper suggestions in in making better improvement on this research project.

Moreover, this study is also dedicated to our families, friends, course mates and all the respondents that have participated in our survey. They have provided kind assistance as well as mental and physical supports towards our final year project. Lastly, we would like to dedicate this study to the future researchers in assisting them to carry out their researches in the future.

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LIST OF ABBREVIATIONS

AA	Actual adoption
AGFI	Adjusted goodness-of-fix index
ATT	Attitude
AVE	Average variance extracted
B.C.	Before Christ
BNM	Bank Negara Malaysia
COVID-19	Coronavirus disease outbreak 2019
GS	Government support
IA	Intention to adopt
MCMC	Malaysian Communication and Multimedia Communication
PEOU	Perceived ease of use
PLS-SEM	Partial Least Squares- Structural Equation Modeling
PR	Perceived risk
PU	Perceived usefulness
RFID	Radio-frequency identification
SEM	Structural Equation Modelling
SME	Small and medium enterprise
SPSS	Statistical Package for Social Science
TAM	Technology acceptance model
TPB	Theory of Planned Behavior
TRA	Theory of reasoned action

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PREFACE

Mobile payments have become common technology in China nowadays to the extent that paying with physical cash is practically being replaced. The popularity of e-wallet in China somehow shows to provide a strong fundamental in the Chinese markets. With the popularization of smartphone, the culture of making transaction via smartphone has become a new norm in different countries. With the growing number of tourists from China, Asia countries should learn some lessons to drive their market towards a cashless society. This can enable the countries to fit themselves into the payment behaviour of Chinese tourist and increase the tourism activities.

Furthermore, with the involvement of government to stimulate the adoption of e-wallet among residents, it has motivated us to discover the role of government on actual adoption of e-wallet in Malaysian context. This study is to explore the moderating effect of government support on actual adoption of e-wallet by surveying the mobile phone users in Malaysia.

Lastly, we hope that our study can provide the readers with a better insight and knowledge of the role of government on e-wallet adoption among the Malaysia citizens.

ABSTRACT

The study is aimed to examine the moderating effect of government support on actual adoption of e-wallet among mobile phone users in Malaysia. The study determines the presence of moderating effect of government support on the actual adoption of e-wallet by including determinants such as perceived ease of use, perceived usefulness, perceived risk, users' attitude and intention to adopt e-wallet with the aid of extended Technology Acceptance Model (TAM). The target respondents for this study are the mobile phone users of e-wallet in Malaysia. Our survey involves 434 respondents. Smart Partial Least Squares 3 software (Smart PLS 3) is used to assist in our data analysis along the research. Reliability test, convergent and discriminant validity, and significance of variables are applied in our data analysis. Our results indicate that government support could not moderate the relationship between intention to adopt and actual adoption of e-wallet. However, we find that government support could significantly provide the direct positive influence on mobile phone users' actual adoption of e-wallet.

CHAPTER 1: INTRODUCTION

1.1 Background

Money evolution is one of the most noteworthy accomplishments and civilization of human. Money is used for trading goods during the early times and later for banking and financial transaction. The form of money has changed from animal skin, metal, weapon to paper. First the use of minted coins around 770 before Christ (B.C.) that replaces the use of metal tools like weapons. Since 700 B.C., the use of paper money had been replaced by the usage of coins in China. Until 16th century, the banks in Europe officially started to use banknotes for depositors and borrowers.

Since 1950s, consumers start to adopt plastic money as their preferred payment method. Apart from this, the use of plastic money such as debit and credit cards changed their behaviour in daily transaction during the era of modernization. In the 1990s, e-payment is introduced to substitute the actual physical cash in carrying out daily transactions including bill payment, money transfer and even mobile banking. In 2011, with the popularization of smartphone, Google became the first company that introduced the use of e-wallet in the world (Kalyani, 2016). Nowadays, the form of money has been currently changed to digital money (Ferreira & Perry, 2015). The money evolution is shown in Figure 1.1.

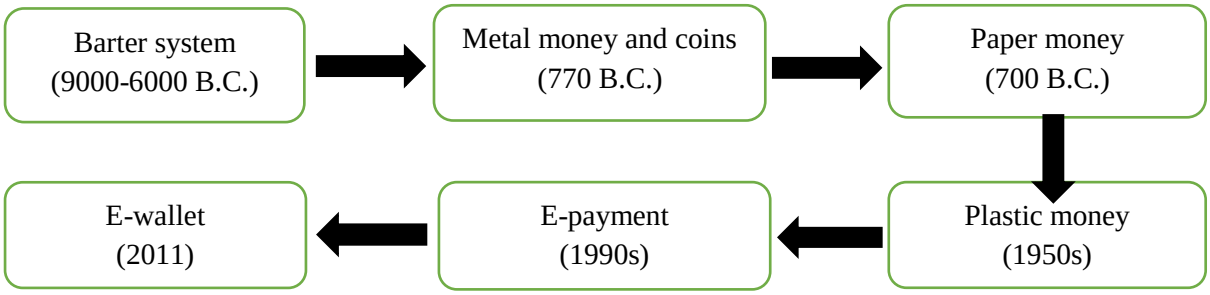

Figure 1.1: Timeline of money evolution

An e-wallet is known as a digital wallet. It is used as an online payment system to keep information related to financial and personal information. In turn, users could make their online purchases on products and services by transferring money to sellers via a smartphone application, where its method of payment is the same with the use of debit and credit cards. For e-wallet, it does not require customers to use the physical card in dealing with any transactions. It is not similar to a debit card that links to bank saving account, the e-wallet does not pay interest to the users for saving money in e-wallet, but it does compensate the users by organizing cash back and discounts events for using them to make transactions. Unlike credit cards, the balance in e-wallet needs to be reloaded by users for their transactions in the future. Due to the popularity of using smartphones and the gradual increasing of e-commerce activities, e-wallet is anticipated to be an effective tool that allows transactions to be more transparency and efficiency.

Currently, the use of physical cash significantly declines in society due to the following reasons. The first reason is to decrease the crime rate by encouraging users not to hold their cash on hands. For example, in the context of United States, the usage of physical money that involves all transactions has been accounted for 40.2% in 2012. However, the usage is recorded at only 30% in 2017 and further declined to be 26% in 2018. In addition, debit cards are turned to be a preference among consumers in making their payments. As a result, card payments have made up to 51% of all financial transactions (Federal Reserve Bank of San Francisco, 2019). In other nations, the transition from the use of physical cash payment to e-payment is observed to happen in transforming their society into the cashless society. For example, the government of Sweden has planned to eradicate the use of paper money by 2023 and managed to cut its usage by 13% in 2018 (Sveriges Riksbank, 2018). On the other hand, the Indian government has announced the demonetization campaign in 2016 and the government of United Kingdom has managed to eliminate cash spending by 16% in 2018 (UK Finance, 2019).

By moving into the cashless society, crime rates in the nation could be further reduced and eradicated. The increasing number of adopting electronic payments has contributed to the declination of crime rates. For instance, Wright et al. (2017) conduct their pilot test on individuals that received government incentives via electronic payments and those who received them in cash or cheques. They find that crime rate in cashless regions of United States

declined by 9.2%. Their finding demonstrates that chances of holding cash on hand have become low, thereby decreasing the possibility of occurring crime rates.

Second reason is to increase the convenience for users in making a transaction without involving money exchange. In the cashless society, a simple swipe or scan via contactless mobile payment has greatly improved consumers' purchasing experience. For example, international travel could be easier and convenient even without cash. Furthermore, the frustration of converting currency exchanges could also be eliminated. As a result, travelers could digitally perform their every transaction without calculating the exchange rate manually. As a result, they tend to be less anxious of missing cash during their travelling period because every payment made is traceable in electronic payment application. Hence, they could spend lesser time on searching for dollar bills and fumbling with foreign currency changes.

The understanding of acceptance motives and obstacles is important for users to develop sustainable approaches in the application of e-wallet system from manufacturers to financial institutions as well as from small to large vendors. Given that China boasts the world's most robust mobile wallet market, however, the low adoption of e-wallet in most other Asian countries has come into the mind. The technology giants, Alibaba and Tencent have ever since dominated the global market with their own designated e-wallets, Alipay and WeChat Pay. The popularity of e-wallet in China somehow shows to provide a strong fundamental for Chinese markets. Yet South-East Asia should learn some lessons to drive their residents towards a cashless society.

There are several local and international players across different markets in Southeast Asia where the e-wallet race has attracted a heterogenous mix of firms. The two ride-hailing services gain the highest popularity in the respective countries, which have their own payment platforms. For example, Indonesia’s Go-Jek has Go-Pay and Singapore’s Grab has GrabPay. In Malaysia, the number of licensed non-financial institutions for e-money issuers grew from 25 in 2016 to 47 at the end of June in 2018 with payment solutions provided via mobile applications by these issuers (Central Bank of Malaysia, 2018).

In recent years, the mobile wallet market in China has transformed its payment landscape drastically and it is matured enough to spread the contactless payment culture to other Asian countries. China provides a large number of tourist arrivals and contributes to a large portion of tourist income in Malaysia. As a result, Malaysia has imitated the mobile payment cultures from China to suit the spending behaviour of the tourists especially from China. Malaysia has welcomed over 2 million tourists from China since 2016. This number of arrivals for Chinese tourist has increased to over 3 million in 2019. In 2019, the total expenditures from China tourists has accounted for 17.8% of the total tourist expenditures in Malaysia (Tourism Malaysia, 2020).

Since Malaysia has become one of the favourite travel destinations, some of the China-based e-wallet issuers have also grabbed the opportunity to launch their e-wallet in Malaysia, for example, Alipay and WeChat Pay. In addition, Malaysia government has implemented digital incentives of eTunai Rakyat and ePENJANA to stimulate the adoption of e-wallet as well as to boost the sluggish economy. Furthermore, during the COVID-19 pandemic, the contactless payment method featured by e-wallet has played an important role to prevent the spreading of virus. The e-wallet has proven its importance and convenience during this challenging period and it is well-positioned to become a new trend in the payment system in Malaysia.

1.2 Problem statement

In Malaysia, security, overspending, merchant acceptance and internet coverage are the major factors that causing the low actual adoption of e-wallet among mobile phone users. To stimulate the adoption among residents, the government has announced Budget 2020 to boost more businesses into the digital in line with the Fourth Industrial Revolution (Ministry of Finance Malaysia, 2019). Based on the Financial Sector Blueprint 2011-2020, The Malaysian government also stood to save about 1% in cost savings to gross domestic product by converting all payments into electronics (Central Bank of Malaysia, 2011). Hence, a transaction

through the use of e-wallet plays as an important role to provide a transformative impact in making a cashless society for better connectivity.

According to Malaysia Payment Landscape (2018), 67% of Malaysian customers used cashless payments mostly through debit card and online banking (Nielsen Malaysia, 2018). According to Hand Phone Users Survey (2018), the percentage in penetration rate of smartphones rose by 2.1% from 75.9% in 2017 to 78% in 2018 (Malaysian Communications and Multimedia Commission [MCMC], 2019). In 2018, the survey also showed that 94.6% of smartphone users are browsing the Internet via their smartphones (MCMC, 2019). Based on a high smartphone penetration rate in Malaysia, the use of smartphones could perfectly act as a method of performing transaction to deal without extra base charges (Central Bank of Malaysia, 2018). However, the use of e-wallet is only accounted for 8% of non-cash payment forms as a significant distractor. Moreover, 50% of non-users worry about digital money theft and 27% indicates that merchant acceptance is low (Nielsen Malaysia, 2018).

Firstly, security concern and risk are the biggest barriers that affect e-wallet users' actual adoption. The rising cases of abusing personal information and transaction records with the adoption of e-wallet has led to higher risk concern among e-wallet users. The reason is that the amount of licensed non-bank e-money issuers in Malaysia such as Boost and Touch N Go has doubled and accumulated to 47 of them. This amount has provided an untruthful signal to non e-wallet users. Based on the case published by Wong (2020), an e-wallet user reported that her Touch N Go wallet has been hacked by an unknown user. The account was reloaded automatically from her debit card and transfer to respective accounts amounting to RM3,000 within an hour. Several users were then become insecure because of the low protection provided by e-wallet.

Secondly, people concern about the problem of overspending with the adoption of e-wallet. The use of e-wallet could increase the number of transaction and the amount of cash flow. People only need mobile devices to perform payments without carrying any cards or physical money. Thus, the ease of adopting e-wallet would increase the chances of spending money on unnecessary items as well. For example, 34% of non-users in e-wallet were worried regarding

over-expenditure (Nielsen Malaysia, 2018). The adoption of e-wallet increases users' desire in spending money. As reported by Central Bank of Malaysia (2018), the use of mobile payment in 2017 has increased the number of transactions from 2 million to 33.7 million in the following year with an average transaction size of RM23.80.

Thirdly, the issue of low actual adoption of e-wallet is the low rate of merchant acceptance in Malaysia. Based on our observations in New Town of Kampar, several shops are seemed to be accepting more than one e-wallet. Touch N Go has only 135,000 merchant acceptance points respectively in nationwide (Touch N Go, 2020). The low rate of merchant acceptance is unable to satisfy the high rate of adoption of e-wallet users in their daily spending.

Fourthly, the government in Malaysia still does not provide full coverage of mobile networks even in Wilayah Persekutuan Kuala Lumpur (as shown in Figure 1.2). Lack of mobile internet coverage is one of the root causes of mobile phone users to adopt e-wallet in Malaysia. Limited internet coverage has caused the e-wallet users unable to make their payments in under-development state. Therefore, mobile phone users refuse to adopt e-wallet and doubt the usefulness of e-wallet as compared to physical money.

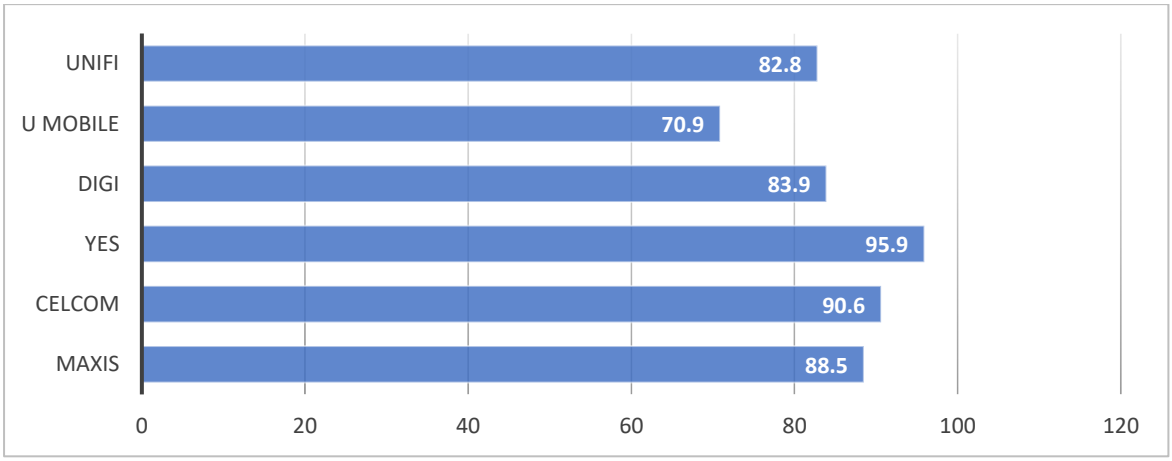

Figure 1.2: 4G availability in Wilayah Persekutuan Kuala Lumpur in percentage, 2019
Source: Mobile Network Experience Report (2019)

In order to significantly increase the actual adoption of e-wallet for Malaysians, participating merchants and SMEs, the Malaysian government aims to provide a support by launching the initiative of one-time RM30 digital stimulus. The terms and conditions require

Malaysian has to be 18 years old and above with yearly income less than RM100,000. Such requirement is to maintain an identity-verified account with selected e-wallet issuers. The government has allocated up to RM450 million for Khazanah Nasional to implement this digital stimulus which is expected to benefit up to 15 million Malaysians (Ministry of Finance Malaysia, 2019). Other than that, during the pandemic of COVID-19, the Malaysian government has rolled out with the ePENJANA initiative amounting to RM750 million to encourage digital payment and practice social distancing. 15 million qualified Malaysians are offered by one-time ePENJANA RM50 credits through e-wallet to boost the economy.

1.3 Research question

Does government support act as a moderator on the relationship between intention to use e-wallet and actual adoption of e-wallet among mobile phone users in Malaysia?

1.4 Research objectives

The main research objectives is to examine:

i. The relationship of perceived ease of use, perceived usefulness and perceived risk towards the attitude to use e-wallet among mobile phone users in Malaysia.
ii. The relationship between attitude to use-wallet and intention to use e-wallet among mobile phone users in Malaysia.
iii. The relationship between intention to use-wallet and actual adoption of e-wallet among mobile phone users in Malaysia.
iv. Whether government support can moderate the relationship between intention to use e-wallet and actual adoption of e-wallet among mobile phone users in Malaysia.

1.5 Significance of study

This study can provide a reference in assisting government to make some improvements in e-wallet services to increase the adoption of e-wallet among mobile phone users. If our finding demonstrates that there is a moderating effect of government support on the actual adoption of e-wallet, the government is suggested to improve the acceptance of e-wallet among mobile phone users by implementing adequate regulations for e-wallet users. Furthermore, the government also can implement a proper measurement in regulation to prevent the use of e-money for money laundering and ensure issuer of e-wallet to address consumer protection, education and privacy as their priority.

If our finding demonstrates that there is no moderating effect of government support in stimulating the actual adoption of e-wallet, the government should corporate with issuer of e-wallet to improve the adoption of e-wallet. Their cooperation is expected to enhance the safety of the e-money data and records through the e-wallet system.

1.6 Chapter layout

After Chapter 1, the structure of thesis is presented as follows. Chapter 2 provides discussion about the theoretical literature review for the variables used in this study. Chapter 3 provides the research methodology, data collection, sampling design, analysis of data and research instruments. Furthermore, Chapter 4 provides interpretation of the results from partial least squares method for structural equation modelling. Lastly, Chapter 5 provides summarizes for the entire study, suggestion of theoretical and practical implications, limitation and recommendation for the study.

CHAPTER 2: LITERATURE REVIEW

2.1 Theoretical framework

Davis (1989) proposes the "Technology Acceptance Model" (TAM) to explain how the technology users could accept the system. According to the author, perceived ease of use and perceived usefulness are the main constructs in developing attitudes and behaviour towards the implementation of information technology. To improve the model, Amoroso and Magnier-Watanabe (2012) extend the TAM by including external determinants, perceived risk which is omitted from the initial model. By including the important determinants, their extended model could be used to explain better the technology acceptance in current society. They carry out a survey of 250 respondents in Japan and find that perceived risk has an impact on attitude toward using of mobile wallet. Lai and Zainal (2015), Ooi and Tan (2016) and Alkailani (2016) further use the extended TAM on online payment acceptance to examine human behaviour towards the use of this technology. Although existing studies using TAM have shown that the constructs have an impact on people's decisions to use online payment, but majority of them are concerned about the use and purpose to use. Hence, this study focus on the actual adoption of e-wallets.

Davis (1989) defines that perceived ease of use is the users' perception on using a system would be at least effort. System users' perceived ease of use has been evaluated as an important variable that will directly affects attitude development towards the technology system. This is because if a system user can understand easily and use with ease, their desired output could be generated via the system. According to Abrazhevich (2001), he finds that consumers prefer to use provided e-payment system because its design is effective and easy to use. For example, if the new payment system is easy to understand and use, customers can feel at ease to adopt and use the e-payment.

Furthermore, Teo, Lim and Lai (1999) find that internet users' perceived ease of use has an impact on their attitudes and intention to use. Gefen, Karahanna and Straub (2003) conduct the similar study by focusing on internet shoppers, they find that online commerce's perceived ease of use is important to the online shopper's attitude to perform online shopping. Besides, Yang (2005) finds that perceived ease of use affects the attitude of users towards mobile payment in Singapore after conducting survey among 866 students. Based on studies by Dahlberg and Mallat (2002), Ovum (2012), and Liébana-Cabanillas, Sánchez-Fernández and Muñoz-Leiva (2014), perceived ease of use is one of the important determinants in shaping the attitudes towards mobile payment adoption. Moreover, Chitungo and Munongo (2013) find that perceived ease of use could provide interest and shaping attitudes on the usage of m-banking services in rural areas of Zimbabwe. They observe that perceived ease of use could significantly contribute to the effect on users' attitude, hence affecting the intention to adopt m-banking. By performing a survey on 530 respondents in context of Canada, Kafsh (2015) finds that their perceived ease of use could be used in predicting their mobile wallet adoption.

By performing a survey on 410 shoppers who have smartphones, Hubert, Blut, Brock, Backhaus and Eberhardt (2017) find that shoppers' perceived ease of use of the technological system could influence their attitude. Their finding demonstrates that those selected shoppers tend to use their mobile payment system devices because it is easy to use relative to their current payment methods, thereby shaping their attitude towards the system. Hence, the following Hypothesis 1 is formed:

Hypothesis 1 (HT1): Users' perceived ease of use significantly influences their attitude towards technology.

Some studies find that perceived usefulness is one of the determinants of technology acceptance. For instance, Davis, Bagozzi and Warshaw (1992) find that the usefulness in a system or new technology is determined as perceived usefulness construct in the relevant literature. Venkatesh and Davis (2000) examine TAM and affirm that perceived usefulness is legitimate in foreseeing an individual's acknowledgment of numerous systems. Venkatesh, Morris and Davis (2003) include the relevant construct into a similar model. Van der Heijden, Verhagen and Creemers (2003) examine the influence of users' perceived usefulness towards

their attitude to adopt a new technology. Based on their findings, users' perceived usefulness is directly affecting users' attitude towards online purchasing. When the online store offers efficient facilities, they obtain high evaluations in perceived usefulness from their respondents. Nysveen (2005) finds that users' perceived usefulness are likely to influence users' attitude toward mobile services. Apart for this finding, they categorize user-friendliness to be one of indicators for users' perceived usefulness.

Among 263 respondents in the content of Germany, Koenig-Lewis, Palmer and Moll (2010) find that users' perceived usefulness is a significant determinant mobile banking services adoption. Lu, Cao, Wang and Yang (2011) explain that users could perform their transactions and access their banking accounts at any time through mobile banking services. There is no time limitation when performing financial transactions. Fee required for fund transfer via mobile banking is lower than retail outlets as well. According to Akturan and Tezcan (2012), mobile phone users tend to adopt mobile banking application if the application provides convenience on financial transactions and users perceive it as advantageous. As a result, all these benefits that consider as users' perceived usefulness has an impact on their attitude to adopt mobile banking services.

In the context of China, Li, Chung and Fiore (2017) examine the effect of consumers' perceived usefulness on attitude towards electronic auctions. Their finding indicates that speed of internet connection, effective and efficient functions provide good auction experience for consumers which is related to consumers' perceived usefulness. Min, So and Jeong (2018) state that users' perceived usefulness highly contributes to users' attitude toward adopting Uber mobile application. They find that advantage, compatibility and complexity of mobile application are significantly related to users' perceived usefulness. Based on these findings, users' perceived usefulness has a positive impact on technology acceptance. Users' perceived usefulness refer to how much the users willing to accept the hypothesis, which is utilizing a system tend to improve their tasks performance. Hence, the following Hypothesis 2 is formed.

Hypothesis 2 (HT2): Users' perceived usefulness significantly influences their attitude towards technology.

Bauer (1960) defines perceived risk is the customer's perception of negative side of an outcome or uncertainty associated with some certain behavior in acceptance of new technology. In Singapore, Teo and Yeong (2003) conduct a study of online shopping environment. They find out the consumers' risk concern is the loss of stored privacy data, the linked card credit and hijack mobile phone account. Losing mobile phones and identity theft are the major concerns of the consumers in online purchasing environment. Those risks become a barrier for consumers to adopt e-payment technology. In the context of Saudi Arabia, Al-Gahtani (2011) uses an extended TAM with three constructs such as trust, credibility and perceived risks related to examine e-transactions. He demonstrates that security risk is the barrier of consumers in using e-transactions technology. He also finds that perceived risk is one of important and common factors could be used to examine the acceptance of e-technology.

In the context of Taiwan, Wu and Wang (2005) attempt to integrate innovation diffusion theory, perceived risk in investigating the mobile commerce acceptance. They find that consumers get attention to use mobile payment if the e-wallet system is safe and secure for their daily transaction. In the context of Korea, Kim, Mirsobit and Lee (2010) find that security could affect the adoption of e-wallet system among users. They conclude that the perceived risk become higher due to the low security of system can become a restriction for users to adopt mobile payment. In addition, Liébana-Cabanillas et al. (2014) demonstrate that users' risk concerns regarding the security of mobile payment systems are the key factors that affect their attitude in adopting this technology. Hence, the following Hypothesis 3 is formed:

Hypothesis 3 (HT3): Users' perceived risk significantly influences their attitude towards technology.

Ajzen and Fishbein (1980) and Pee, Woon and Kankanhalli (2008) state theoretical models such as TAM, Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) could be used to demonstrate that attitude is an integral pre-requisite of the intention to adopt a certain behaviour. According to Yang (2010), attitude represents human positive or negative feelings towards the results of a certain behaviour. In other words, persons' actual behaviour depends on their attitude. With the adoption of an extended TPB model, Yang (2012) establishes a connection between attitude and intention to adopt mobile shopping. Shiau and Luo (2012)

demonstrates that attitude significantly reflects the satisfaction of consumers with their future intention to online group buying.

Crespo, de los Salmones Sánchez and del Bosque (2013) observe that former online shopping buyers would demonstrate the effect of attitudes towards e-commerce on intention to purchase in Spain. In the context of the United States, Bailey, Pentina, Mishra and Mimoun (2017) argue that buyers' attitudes towards technology positively influence their intention to use in mobile payment. In near-field communication which is based on mobile payment technology, Khalilzadeh, Ozturk, and Bilgihan (2017) use extended unified theory of acceptance and use of technology model. They find that attitude to use positively influences the behavioural intention to use in the North American restaurant industry. Furthermore, Chi (2018) finds that attitude has a positive effect on the Chinese consumer's intention to opt for mobile commerce by adopting an extended TAM approach. Hence, the following Hypothesis 4 is formed:

Hypothesis 4 (HT4): Users' attitude significantly influences their intention towards technology.

Davis, Bahozzi and Warshaw (1989) and Sun and Zhang (2004) interpret that intention to adopt is a measure of the probability that the application tends to be approved by an individual and forecasts the actual adoption of technology. Wu and Wang (2005) state that actual adoption of e-wallet is the retention and the frequency of using e-wallet in a given period of time. Miltgen, Popovič and Oliveira (2013) state that those internet users who have a stronger propensity to adopt innovations are likely to adopt a new mobile payment system.

Based on the study in examining perception towards online electronic payment among Greek bank's customers, Rigopoulos and Askounis (2007) find the presence of a positive relationship between intention to adopt and the real usage. By using TAM in the context of the United States, Tao (2009) finds that a significant relationship between intention to use and actual use of electronic information resources is not in the existence. In the context of India, Gupta, Dogra, and George (2018) find that tourists' intention to use the smartphone travel

applications positively influences their usage behavior. Hence, the following Hypothesis 5 is formed:

Hypothesis 5 (HT5): Users' intention to adopt positively influences their actual adoption towards technology.

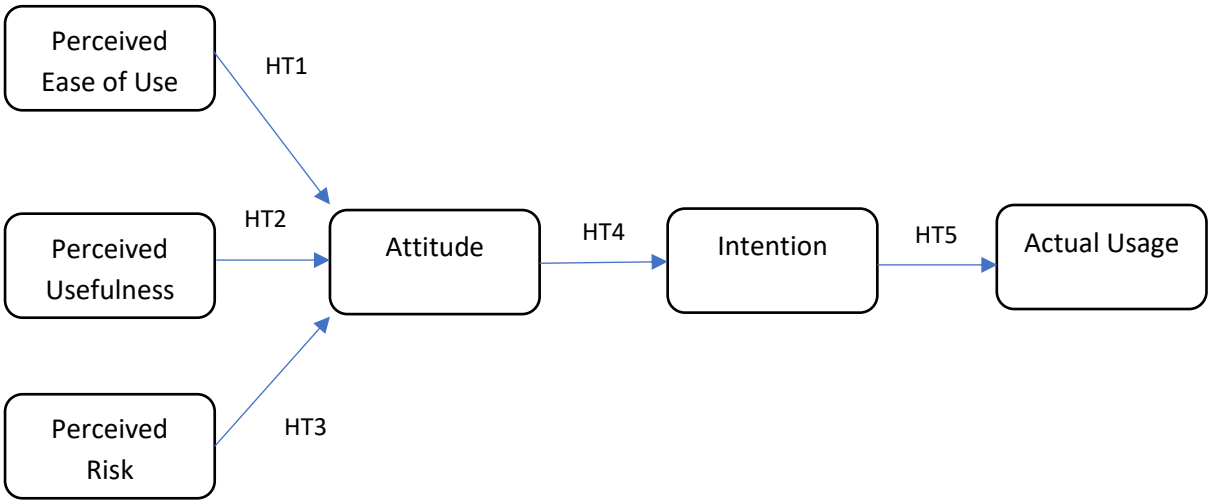

Figure 2.1: Extended technology acceptance model
Source: Amoroso and Magnier-Watanabe (2012)

2.2 Conceptual framework

To overcome the inadequacy of the extended technological acceptance model that focus on internet usage and mobile banking, we improve the model to better fit the actual e-wallet adoption in the context of Malaysia by incorporating government support that acts as a moderating variable. Our conceptual framework is shown in Figure 2.2.

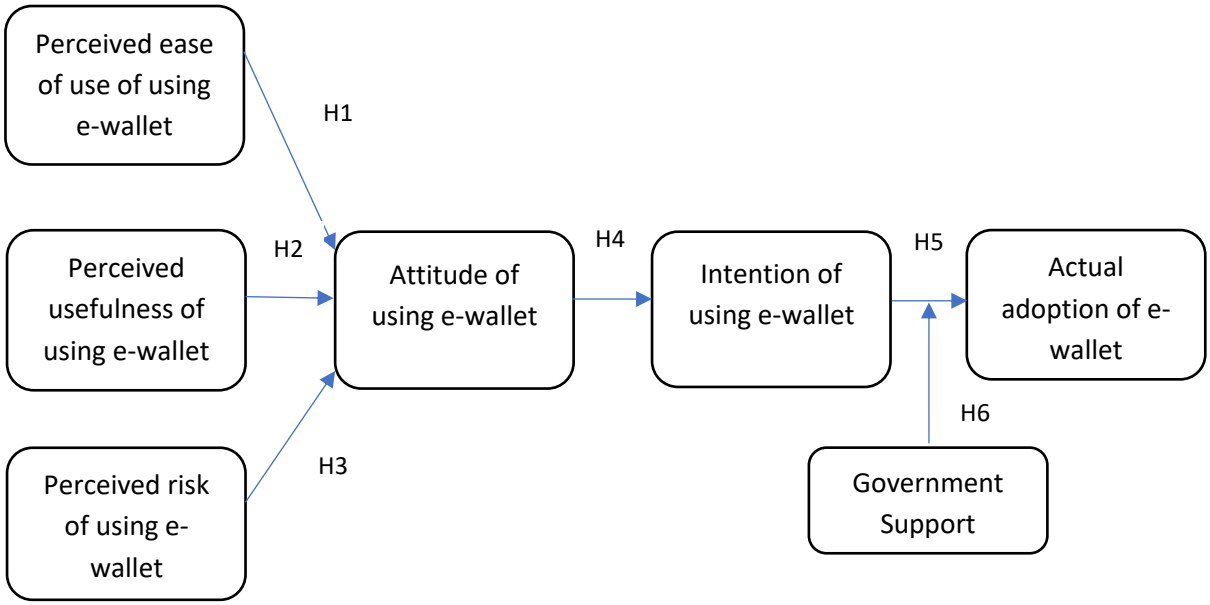

Figure 2.2: Conceptual framework of mobile phones users' actual adoption of e-wallet in Malaysia
Source: Candidates' own framework

Based on the five hypotheses from the theoretical framework, the attention of existing studies that use the framework focus on adoption of internet and mobile banking in developed countries such as the United States, Japan and Singapore. However, we find that there is a lack of study on the actual e-wallet adoption in context of the developing country, namely Malaysia. In this regard, we develop our conceptual framework to suit our study with the title of actual adoption of e-wallet among mobile phone users in Malaysian context. To perform the analysis according to the framework, we test the following hypotheses.

Hypothesis 1 (H1): Mobile phone users' perceived ease of use significantly influences their attitude towards e-wallet adoption in Malaysia.

Hypothesis 2 (H2): Mobile phone users' perceived usefulness significantly influences their attitude towards e-wallet adoption in Malaysia.

Hypothesis 3 (H3): Mobile phone users' perceived risk significantly influences their attitude towards e-wallet adoption in Malaysia.

Hypothesis 4 (H4): Mobile phone users' attitude significantly influences their intention towards e-wallet adoption in Malaysia.

Hypothesis 5 (H5): Mobile phone users' intention significantly influences their actual adoption towards e-wallet in Malaysia.

According to Moon Bretschneider (1997) and Caiazza (2016), they find that government support plays an important role in the market penetration of some innovative technology products and services. Their findings imply that government support is an efficient instrument to motivate the demand of innovations by developing infrastructures. Those initiatives can prevent the market failure of innovations that can generate huge advanced value to the society. Lin and Ho (2009) find that government supports play an important role in the adoption of innovations. They find that government support through providing resources and policies in the adoption of radio-frequency identification (RFID) technology in China logistic industry. In the context of South Korea, Kang and Park (2012) conduct a survey on SMEs in biotechnology and they find that government support plays a positive role in promoting innovation output. In the context of United Kingdom, Ramanathan, Ramanathan and Ko (2014) conduct a survey on logistic firms to demonstrate that government supports could moderate the relationship between users' value attributes and RFID adoption. Furthermore, they find that the government support has also received scant attention in the electric vehicle adoption literature. Based on these existing findings, we consider government support as our moderator in moderating the relationship between intention to use and actual adoption in our conceptual framework of e-wallet.

The consideration of government support can enhance the TAM in order to have better understand about the actual usage of e-wallet in Malaysia. We hypothesize that government support could provide a stronger link between the intention to adopt e-wallet and actual

adoption of e-wallet among mobile phone users in Malaysia. Hence, the following Hypothesis 6 is tested.

Hypothesis 6 (H6): Government support positively moderates the relationship between intention to adopt and actual adoption of e-wallet among mobile phone users in Malaysia.

2.3 Gap of literature

Most existing studies are found to use the TAM model in investigating adoption of technology and mobile banking among targeted users. Although a few studies have examined adoption of technology by considering the government support in some innovative technology products and services, but there is still lack of studies that focus on the moderating effect of government support between intention to adopt and actual adoption of e-wallet. Therefore, the aim of our study is to examine whether government support can play a role of moderator in influencing the relationship between intention to use and actual adoption of e-wallet in Malaysia.

CHAPTER 3: DATA AND METHODOLOGY

3.1 Data description

3.1.1 Targeted respondents

The targeted respondents for this study are the mobile phone users in Malaysia. To be more specific, we decide to focus on the respondents who are using the e-wallet via mobile phone. The responses from the targeted respondents can be used to study the moderating effect of government support between the intention and actual adoption of e-wallet in Malaysia.

3.1.2 Selected sampling technique

In this study, non-probability sampling technique is used because there is no sampling frame for e-wallet users in Malaysia. Among non-probability sampling techniques, the convenience sampling through online is adopted because we can obtain those mobile phone users to be our respondents who are readily and available in spending their time to fill the questionnaire.

3.1.3 Designed questionnaire

The designed questionnaire consists of Section A and B. In Section A, respondents are required to provide their demographic-related information. For example, their gender, age group, religion, education level, occupation, annual personal income and frequency of using e-wallets. In order to conduct the preliminary analysis about their background, a nominal scale is used for gender, religion, occupation and frequency of using e-wallets. An ordinal scale is used for age group, education level and annual personal income.

In Section B, respondents are further required to indicate their response for each statement about perceived ease of use, perceived usefulness, perceived risk, attitude, intention to adopt e-wallet, government support and actual adoption of e-wallet. To measure their response, the Likert scale is used. In order to avoid most respondents to provide their neutral responses, a 6-Likert scale is chosen in our study, where the scale ranges from 1 (denotes "Strongly Disagree") to 6 (denotes "Strongly Agree"). All items for each construct are shown in Table 3.1.

Table 3.1: Summary of items for constructs

	No. of item(s)	**Items**	**Scale**
Perceived Ease of Use	3	PEOU1: The registration of e-wallet is easy. PEOU2: The use of e-wallet is simple. PEOU3: The use of e-wallet is easy to be learned.	Strongly Disagree (1) to Strongly Agree (6)
Perceived Usefulness	4	PU1: The use of e-wallet can perform my transaction(s) quickly. PU2: The use of e-wallet can control my payment activities. PU3: The use of e-wallet can improve effectiveness of transaction(s). PU4: The use of e-wallet can perform fund transfer to others	Strongly Disagree (1) to Strongly Agree (6)
Perceived Risk	3	PR1: The use of e-wallet can provide security on my personal information. PR2: The use of e-wallet can secure my transaction(s). PR3: The use of e-wallet can reduce error in my payment.	Strongly Disagree (1) to Strongly Agree (6)

Table 3.1: (Continued)

	No. of item(s)	Items	Scale
Attitude	4	ATT1: I use e-wallet because it is a current trend of transaction. ATT2: I use e-wallet because it is a better choice of making my payment. ATT3: I use e-wallet because it is widely accepted. ATT4: I use e-wallet because it is easy to carry.	Strongly Disagree (1) to Strongly Agree (6)
Intention to Adopt	3	IA1: I intend to use e-wallet if the internet has high coverage. IA2: I intend to use e-wallet when the merchants have a high acceptance rate. IA3: I intend to use e-wallet if the application runs smoothly.	Strongly Disagree (1) to Strongly Agree (6)
Government Support	5	GS1: The implementation cashless payment facilities in government clinics encourage the adoption of e-wallet. GS2: The implementation of "*RM30 digital incentives*" encourages the adoption of e-wallet. GS3: The implementation of "*ePenjana Credit*" through voucher, cashback and discount encourages the adoption of e-wallet. GS4: The implementation of bill payment for government utilities through "*e-pay*" encourages the adoption of e-wallet. GS5: The implementation of digital street parking payment encourages the adoption of e-wallet.	Strongly Disagree (1) to Strongly Agree (6)
Actual Adoption	3	AA1: I prefer to use e-wallet rather than cash payment. AA2: I will adopt e-wallet if people surrounding me are using e-wallet. AA3: I will adopt e-wallet because it increases my purchase experience.	Strongly Disagree (1) to Strongly Agree (6)

3.1.4 Method of data collection

The data collection is conducted through online method. We use this method as our targeted respondents are the mobile phone users from Malaysia, it is the most cost-effective method to collect data remotely through online. By considering the COVID-19 pandemic, we do not perform face-to-face interview to prevent the spread of COVID-19 virus by social distancing. In this case, we use Qualtrics platform to attach our questionnaire and distribute to respondents through social media platforms such as Facebook and Instagram. In order to get more targeted respondents from Malaysia, we

utilize the location targeting function under the platform of social media by sponsoring our posts. A total of 538 mobile phone users have participated in our survey and we manage to collect 434 useable questionnaires, which yield 80.7% of response rate. We are able to get the respondents mostly from Wilayah Persekutuan Kuala Lumpur due to the city has more active mobile phone users of e-wallet.

3.1.5 Pilot test

Pilot study is performed to determine response rate. For example, we could examine the reliability of the questionnaire before we conduct data collection for the actual survey. We distribute the questionnaire through both face to face and online method. We distribute our questionnaires through Skype, Zoom and WhatsApp amid the period of COVID-19 pandemic. We conduct the pilot test through face to face method with our family members. For the relatives and friends that we cannot reach physically, we adopt the online method for the pilot test. We target 30 family members and close friends to be participated in the pilot test.

Throughout the test, we communicate with them to clarify whether they could clearly understand about each statement in the questionnaire. Through their feedbacks, we can make necessary amendments to ensure the use of appropriate language, sentence structure and proper wording. With these precautions, the possibility of filling up some questions without exactly understanding the content of those questions could be eliminated. After completing the pilot study, we are able to determine the possible problems that might happen and examine the effectiveness and efficiency of technique used through data processing.

3.1.6 Data processing

Data processing is a method to retrieve and verify the primary data to be used for computation process. The steps of data processing including questionnaire checking, data editing and data coding. The data processing process is applied on the pilot test results to make amendments if there is any. Smart PLS 3 is used to process the data through computer to obtain meaningful information.

Before the questionnaire is distributed to our targeted respondents, the pilot test questionnaire had gone through checking of grammar, item and sentence formation. All items in the questionnaire are abstract and adopted from the existing studies. We detect the omission of item and convergent validity between each item to ensure the data set has no correlation. The identified problems are amended before we distribute to our target respondents.

Data editing is used to review and adjust the set of collected data to ensure the quality of the collected data of pilot test. The error or bias in data within the pilot test questionnaire is detected and amended before being used to present as useful information. This process ensures the data provided by respondents is unbiased, complete and consistent.

After the data editing process, data coding would be carried out to classify each item in the questionnaire by using code or number. The coding process could help us to save time and simplify the data computation process.

Table 3.2: Coding for demographic-related variables

Q1	Gender	- "Male" = 0 - "Female" = 1
Q2	Age	- "Below 21 years old" = 1 - "Between 21-30 years old" = 2 - "Between 31-40 years old" = 3 - "Between 41-50 years old" = 4 - "51 years old and above" = 5
Q3	Religion	- "No religion" = 1 - "Muslim" = 2 - "Buddhist" = 3 - "Hindu" = 4 - "Christian" = 5
Q4	Education	- "Primary" = 1 - "Secondary" = 2 - "Undergraduate" = 3 - "Postgraduate" = 4
Q5	Occupation	- "Unemployed" = 1 - "Employed" = 2 - "Self-employed" = 3 - "Household" = 4 - "Student" = 5 - "Retiree" = 6
Q6	Annual personal income	- "Below RM20,000" = 1 - "RM20,001-RM40,000" = 2 - "RM40,001-RM60,000" = 3 - "RM60,001-RM100,000" = 4 - "RM100,001-RM200,000" = 5 - "More than RM200,001" = 6
Q7	E-wallet usage frequency	- "Never" = 1 - "Sometimes" = 2 - "Always" = 3

3.2 Methodology

3.2.1 Descriptive analysis

Descriptive analysis is used to simplify the information in a sensible way. We summarize the data that collected in survey and give a description for the data. We carry out descriptive analysis for the basic demographic frequency of respondents in our study, for example, gender, age group, religion, education level, occupation, annual income and weekly usage of e-wallet.

3.2.2 Measurement model

To evaluate our measurement model by appropriate reliability test, we need to perform four steps. The first step, we examine the indicator reliability by using outer loading analysis. If the value of outer loadings is below 0.7, it ought to have deletion of these indicators. Loadings which give value above 0.7 are recommended. The value of outer loadings greater than 0.7 indicates that indicators are satisfactory (Henseler, Ringle & Sinkovics, 2009).

The second step is to assess the internal consistency of reliability by using Cronbach's Alpha. To test the internal consistency of the measurement model, the value of Cronbach's Alpha is required between 0 and 1. Furthermore, higher correlations between items, a higher the alpha value (Tavakol & Dennick, 2011). A low alpha value may be influenced by insufficient number of questions, poorly related between items or heterogeneous. Table 3.3 shows that the scale of Cronbach's Alpha. Based on the rule of thumb for Cronbach's Alpha, the scale should more than 0.7 to indicate that the internal consistency is acceptable (Pallant, 2013).

Table 3.3: Scale of Cronbach's Alpha

	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Source: Sharma (2016)

For the third step, the convergent validity of each construct measure is assessed. The application of average variance extracted (AVE) is to evaluate convergent validity. AVE is a technique, which can be used as a standard in examining the convergent validity for our measurement model. When the value of AVE is equal or above 0.5, the constructs are considered to have sufficient convergent validity (Gotz, Liehr-Gobbers

& Krafft, 2010). The value of AVE that exceeds 0.50 indicates that variance with 50% and above could be sufficiently explained convergent validity (Chin, 2010).

The fourth step is to assess discriminant validity. The assessment of discriminant validity in measurement model is to ensure the causal relationship between latent variables by measuring the distinction between constructs. This validity is an important approach to prevent multicollinearity issues. Fornell and Larcker criterion is the most common strategy to be used for testing the discriminant validity. This method is used to perform discriminant validity by comparing the square root of each AVE with the correlation coefficient for every construct. The correlations of latent variable should have a lower value than the square root of the AVE. If the AVE value is less than another latent variable, it is considered as insufficient discriminant validity. Hence, the AVE of each latent variable should be greater than the latent variable and have highest squared correlation to other latent variable (Fornell & Larcker, 1981).

3.2.3 Structural model

The use of Partial Least Squares Structural Equation Modeling (PLS-SEM) is to determine the complex structural equation model with small sample size (do Valle & Assaker, 2016). To investigate the moderating effect of government support on actual adoption of e-wallet, moderated PLS-SEM is employed in this study. Bootstrapping is a great influential of non-parametric statistical technique in analysing PLS-SEM statistics which using unknown sampling distribution. Bootstrapping is one of techniques to capture the significance of mobile phone users' perceived ease of use, perceived usefulness, and perceived risk, following by their attitude and intention towards actual adoption of e-wallet as well as the moderating effect of government support.

Besides that, bootstrapping can be utilized to evaluate the volatility of statistic by estimating constructs path coefficients (Streukens & Leroi-Werelds, 2016). Furthermore, path coefficients consist a range of standardized values between –1 and +1. If the value of path coefficient is near to zero, it demonstrates that the relationship between the constructs is weak.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Examining respondents' demographic profile

Table 4.1 shows the demographic profile among 434 respondents. Our respondents consist of 55.07% of males and the remaining are females. Moreover, most of our respondents are 21-50 years old. In terms of religious characteristics, 74.19% of respondents are Buddhist, followed by 8.76% are Christian, 7.60% are Muslim, 5.30% are Hindu and 4.15% are non-religious. 70.05% of respondents are undergraduates and 15.44% of them are postgraduates. Furthermore, majority of the respondents are a student which consist of 45.62% and 34.56% of respondents are employees. Besides, 65.21% of total respondents have earned their annual personal income below RM20,000, follow by 16.59% of them have earned between RM20,001-RM40,000 annually and 9.22% of them have earned between RM40,001-RM60,000 annually. In terms of the weekly frequency of using e-wallet, 71.89% of respondents utilize e-wallet occasionally whereas the rest 28.11% of respondents are using e-wallet frequently.

Table 4.1: Demographic profile of respondent.

	Frequency	Percentage
Gender		
Male	239	55.07
Female	195	44.93
Age		
Below 21	42	9.68
Between 21-30	319	73.50
Between 31-40	48	11.06
Between 41-50	14	3.23
51 and above	11	2.53
Religion		
No religion	18	4.15
Muslim	33	7.60
Buddhist	322	74.19
Hindu	23	5.30
Christian	38	8.76
Education		
Primary	6	1.38
Secondary	57	13.13
Undergraduate	304	70.05

Table 4.1: (Continued)

Education (Continued)	Frequency	Percentage
Postgraduate	67	15.44
Occupation		
Unemployed	42	9.68
Employed	150	34.56
Self-employed	31	7.14
Household	11	2.54
Occupation		
Student	198	45.62
Retiree	2	0.46
Income		
Below RM20,000	283	65.21
RM20,001-RM40,000	72	16.59
RM40,001-RM60,000	40	9.22
RM60,001-RM100,000	28	6.45
RM100,001-RM200,000	8	1.84
More than RM200,001	3	0.69
The use of e-wallet per week		
Never	0	0
Sometimes	312	71.89
Always	122	28.11

4.2 Evaluating reliability of constructs

The measurement model has compromised seven constructs such as perceived ease of use, perceived usefulness, perceived risk, users' attitude, intention to adopt, actual adoption and government support. As shown in Table 4.2, outer loadings retained for 25 items belong to all constructs are above 0.70, while Cronbach's alphas for all constructs are found to have values exceeded 0.70. As a result, average variance extracted (AVE) values are turned to be higher than threshold of 0.50. Therefore, we conclude that the measurement model has attained adequate convergent validity.

Table 4.2: Results of testing construct reliability

Variables	Items	Outer Loadings	Cronbach's Alpha	AVE
PEOU	PEOU1	0.841		
	PEOU2	0.886	0.832	0.748
	PEOU3	0.867		
PU	PU1	0.760		
	PU2	0.705	0.767	0.590
	PU3	0.858		
	PU4	0.741		
PR	PR1	0.841		
	PR2	0.898	0.829	0.744

Table 4.2: (Continued)

Variables	Items	Outer Loadings	Cronbach's Alpha	AVE
PR (Continued)	PR3	0.847		
ATT	ATT1	0.700		
	ATT2	0.829	0.820	0.651
	ATT3	0.829		
	ATT4	0.860		
IA	IA1	0.838		
	IA2	0.900	0.832	0.749
	IA3	0.857		
AA	AA1	0.836		
	AA2	0.836	0.802	0.716
	AA3	0.865		
GS	GS1	0.753		
	GS2	0.860		
	GS3	0.824	0.869	0.654
	GS4	0.820		
	GS5	0.780		

Table 4.3 summarizes the results of discriminant validity, which is based on Fornell and Larcker criterion. The results show that the square roots of AVE for PEOU, PU, PR, ATT, IA, AA and GS are greater than the off-diagonal elements in the relevant rows and columns. Overall, discriminant validity can be accepted for this model and supports the discriminant validity between the constructs.

Table 4.3: Results of Fornell-Larcker criterion

	PEOU	PU	PR	ATT	IA	AA	GS
PEOU	0.865						
PU	0.576	0.768					
PR	0.410	0.566	0.862				
ATT	0.505	0.669	0.588	0.807			
IA	0.418	0.517	0.438	0.712	0.866		
AA	0.432	0.590	0.601	0.710	0.603	0.846	
GS	0.491	0.670	0.449	0.664	0.619	0.610	0.808

4.3 Examining mobile phones users' actual adoption of e-wallet in Malaysia

As shown in Table 4.4, the results indicate that mobile phone users' perceived ease of use positively influence their attitudes of e-wallet adoption at the significance level of 1%. This suggests those mobile phone users tend to have a positive attitude in adopting e-wallet when they notice that the use of e-wallet is only requiring a simple registration process and easy to learn. This finding is consistent with the existing studies done by Chitungo and Munongo (2013) and Kafsh (2015). Therefore, Hypothesis 1 is supported.

Perceived usefulness is found to have a significant effect at 1% level in influencing users' attitude to use e-wallet. The reason in behind for supporting the finding is the features such as the application speed, transaction tracking and fund transfer that could encourage users to develop positive attitude towards adoption of e-wallet. The finding supports Hypothesis 2, where it is consistent with the findings from the studies of Koenig-Lewis, Palmer and Moll (2010) and Akturan and Tezcan (2012).

Moreover, mobile phone users' perceived risk is found to positively influence their attitudes towards e-wallet adoption at the significance level of 1%. This finding implies that users concern about their privacy and security that subsequently increase their resistance towards e-wallet. In other words, most of the users who are sensitive towards payment fraud and identity theft tend to transact only if the system could guarantee the security. This finding supports Hypothesis 3. It is consistent with those findings by Kim, Mirsobit and Lee (2010) and Liébana-Cabanillas et al. (2014), demonstrating that users' perceived risk on the security of the e-wallet system can affect the users' attitude towards e-wallet.

Overall, perceived usefulness is found to have greater influence on attitude as compared to perceived ease of use and perceived risk due to its highest path coefficient. This indicates that mobile phone users' perceived usefulness is the most important in determining their willingness to adopt e-wallet. This finding implies that mobile phone users would be more

concerned about the main e-wallet functions such as the effectiveness of transaction and auto-reload feature rather than security and convenience of using the e-wallet.

Furthermore, mobile phone users' attitudes are found to significantly influence their intention towards e-wallet adoption at the level of 1%, agreeing with Yang (2012) and Bailey, Pentina, Mishra and Mimoun (2017). Those mobile phone users who have good attitude would increase their intention to use e-wallet, thereby leading to increase in their actual adoption. Thus, this finding supports Hypothesis 4, where attitude can affect those users' intention to adopt e-wallet.

Our finding indicates that users' intention to adopt also significantly influences their actual adoption of e-wallet at 1% level. Hence, Hypothesis 5 is supported. The finding is consistent with Rigopoulos and Askounis (2007), Tao (2009) and Gupta, Dogra, and George (2018) who find that intention to use electronic technology can positively influence the actual adoption and usage. This suggests that mobile users' perceptions could influence their actual adoption on e-wallet through their attitude and intention to use e-wallet.

The results indicate that government support does not moderate the relationship between mobile phone users' intention to use and their actual adoption even at the significant level of 10%. As a result, Hypothesis 6 is not supported. The finding is contrary to the finding of Ramanathan and Ko (2014), demonstrating that government support could act as a moderator between the usability and actual adoption of RFID.

Table 4.4: Bootstrapping results

Hypothesis	Path	Beta	Standard Error	T-Statistics	P-Value	Decisions
H1	PEOU—>ATT	0.142	0.043	3.283	0.001	Supported
H2	PU—>ATT	0.423	0.049	8.691	0.000	Supported
H3	PR—>ATT	0.291	0.039	7.529	0.000	Supported
H4	ATT—>IA	0.712	0.041	17.286	0.000	Supported
H5	IA—>AA	0.361	0.059	6.095	0.000	Supported
H6	Moderating Effect (GS*IA—>AA)	-0.005	0.024	0.215	0.830	Not Supported

4.3.1 Examining direct influence of government support on mobile phones users' actual adoption of e-wallet in Malaysia

After the testing Hypothesis 1-6, we find that Hypothesis 6 is not supported. Hence, we tend to examine whether government support has a direct influence on actual adoption among mobile phone users beyond our conceptual framework. Our results show that government support has a significant direct effect on actual adoption of e-wallet among mobile phone users at 1% level. Based on this, government support does not act as a moderator to induce the mobile phone users' intention to actual adoption on e-wallet, but it can provide a direct impact to the actual adoption of e-wallet.

CHAPTER 5: CONCLUSION

5.1 Main finding

Our empirical results indicate that government support could not moderate the relationship between intention to adopt and actual adoption of e-wallet. However, we find that government support could significantly provide the direct positive influence on mobile phone users' actual adoption of e-wallet. The reason is that government support is strong enough to induce people to adopt e-wallet directly. The reason to justify such a finding is mobile phone users are preferred to several direct initiatives implemented by the government in terms of campaign and monetary form. For example, the implementation of "*RM30 digital incentives*" and "*ePenjana Credit*".

5.2 Implications

5.2.1 Theoretical implication

To the best of our knowledge, our finding can improve the existing theoretical framework on e-payment from the perspective of the role of government in stimulating the actual adoption of e-wallet. In this regard, various incentives implemented by the government have been emphasized in measuring government support as a moderator between intention to adopt and actual adoption of e-wallet, especially among mobile phone users. Since our finding demonstrates that government support cannot act as a moderator, we suggest that framework should be applicable to actual adoption of e-wallet by focusing on the direct effect of government support instead of its moderating

effect. As a result, this will enhance understanding about the knowledge of this area that can benefit to market players in globalizing the circular economy.

5.2.2 Practical implications

Our finding provides several practical implications in increasing the actual adoption of e-wallet among users in the Malaysian context. Our finding demonstrates that government support plays an important role to directly affect the adoption rate of e-wallet in Malaysia. Since government support has a positive influence on the actual adoption rate of e-wallet, the government can consider to work with e-wallet issuers in continuously promoting the usage of e-wallet with attractive initiatives given to the consumers and merchants. For example, the government can launch more initiatives in the form of cashback and vouchers to greatly induce more citizens to adopt e-wallet in their daily transaction.

Furthermore, the finding also shows that users tend to adopt e-wallet if the payment method is widely accepted. Thus, the government can adopt the e-wallet payment service in the government departments and agencies such as Road Transport Department, Immigration Department and National Registration Department. With the increasing payment spots in government departments, the adoption rate of e-wallet among the citizens will also increase.

Other than that, the internet coverage is also a main concern of the respondents to adopt e-wallet. Apparently, the weak internet coverage is discouraging users from adopting e-wallet, especially in rural areas. Hence, the government can widen the internet coverage especially in rural areas to increase the connectivity of business and trading volumes through e-wallet across different regions.

5.3 Limitation of study

Our study only focuses on mobile phone users that consist of working and non-working adults. Their response cannot be used to provide a comprehensive view of the actual adoption of e-wallet. Indeed, the actual adoption of e-wallet between working and non-working adults is different due to they have different behavioural in allocating their expenditure through the use of e-wallet.

5.4 Recommendation of study

Based on the above limitation, we suggest that future researchers should separate the respondents into those mobile phone users who are working and non-working adults in examining actual adoption of e-wallet. Apart from this, a comparative study between two groups of mobile phone users' who are employed and unemployed can be performed. Since employed and unemployed respondents will have a different perception and opinion towards the use of e-wallet, their responses are expected can provide more insightful findings.

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Appendices

Appendix 1: Empirical results for construct reliability and validity

Construct Reliability and Validity

Matrix | Cronbach's Alpha | rho_A | Composite Reliability

	Cronbach's ...	rho_A	Composite ...	Average Va...
AA	0.802	0.803	0.883	0.716
ATT	0.820	0.836	0.881	0.651
GS	0.869	0.884	0.904	0.654
IA	0.832	0.839	0.900	0.749
Moderating...	0.990	1.000	0.991	0.882
PEOU	0.832	0.838	0.899	0.748
PR	0.829	0.840	0.897	0.744
PU	0.767	0.779	0.851	0.590

Appendix 2: Empirical results for outer loadings

Outer Loadings

Matrix

	AA	ATT	GS	IA	Moderating...	PEOU	PR	PU
AA1	0.836							
AA2	0.836							
AA3	0.865							
ATT1		0.700						
ATT2		0.829						
ATT3		0.829						
ATT4		0.860						
GS1			0.753					
GS1 * IA1					1.827			
GS1 * IA2					1.818			
GS1 * IA3					1.829			
GS2			0.860					
GS2 * IA1					1.853			
GS2 * IA2					1.880			
GS2 * IA3					1.894			

Appendix 2: Empirical results for outer loadings (Continued)

Outer Loadings

Matrix

	AA	ATT	GS	IA	Moderating...	PEOU	PR	PU
GS2 * IA3					1.894			
GS3			0.824					
GS3 * IA1					1.862			
GS3 * IA2					1.901			
GS3 * IA3					1.881			
GS4			0.820					
GS4 * IA1					1.844			
GS4 * IA2					1.854			
GS4 * IA3					1.874			
GS5			0.780					
GS5 * IA1					1.788			
GS5 * IA2					1.741			
GS5 * IA3					1.791			
IA1				0.838				
IA2				0.900				

Outer Loadings

Matrix

	AA	ATT	GS	IA	Moderating...	PEOU	PR	PU
GS5 * IA2					1.741			
GS5 * IA3					1.791			
IA1				0.838				
IA2				0.900				
IA3				0.857				
PEOU1						0.841		
PEOU2						0.886		
PEOU3						0.867		
PR1							0.841	
PR2							0.898	
PR3							0.847	
PU1								0.760
PU2								0.705
PU3								0.858
PU4								0.741

Appendix 3: Empirical results for Fornell-Larcker Criterion

Discriminant Validity

Fornell-Larcker Criterion | Cross Loadings | Heterotrait-Monotrait Ratio (HTMT) | Heterotrait-Monotrait Ratio (HTMT)

	AA	ATT	GS	IA	Moderating...	PEOU	PR	PU
AA	0.846							
ATT	0.710	0.807						
GS	0.610	0.664	0.808					
IA	0.603	0.712	0.619	0.866				
Moderating...	-0.481	-0.608	-0.640	-0.630	0.939			
PEOU	0.432	0.505	0.491	0.418	-0.458	0.865		
PR	0.601	0.588	0.449	0.438	-0.432	0.410	0.862	
PU	0.590	0.669	0.670	0.517	-0.599	0.576	0.566	0.768

Appendix 4: Empirical results for bootstrapping

Mean, STDEV, T-Values, P-Values

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
ATT -> IA	0.712	0.710	0.041	17.286	0.000
GS -> AA	0.380	0.383	0.044	8.701	0.000
IA -> AA	0.361	0.360	0.059	6.095	0.000
Moderating Effect 1 -> AA	-0.005	-0.004	0.024	0.215	0.830
PEOU -> ATT	0.142	0.139	0.043	3.283	0.001
PR -> ATT	0.291	0.293	0.039	7.529	0.000
PU -> ATT	0.423	0.422	0.049	8.691	0.000