Factors Affecting the Intention to Use E-Wallets During the COVID-19 Pandemic

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Abstract: The COVID-19 pandemic has reshaped the lifestyle of Malaysians. The government has introduced various incentives to encourage contactless transactions. Malaysia has also experienced a spike in e-wallet transactions during the COVID-19 pandemic. However, there is no consensus on the reasons behind the rapid increase in the usage of e-wallets. This study aims to fill a knowledge gap by incorporating government support, the perceived risk, and social influence as the potential factors affecting the use of e-wallets. Survey data were collated from 598 respondents using Google Forms and analyzed using covariance-based structural equation modeling (CB-SEM). The findings confirm that perceived usefulness, government support, the perceived risk, and social influence are positively related to the attitude toward the usage of e-wallets. This attitude is also positively related with the user's intention of using the wallets. The outcomes of this study may assist policymakers to devise effective strategies that are able to capture the users' intentions to use e-wallets during the COVID-19 pandemic. This study also recommends that the government increases the incentives to speed up the formation of a cashless society. The related organizations should also enhance public awareness on the usefulness of e-wallets in preventing virus transmission.

Introduction

The COVID-19 virus has affected global health, infecting more than 220 million people, which represents 2.91% of the world's population. Malaysia also detected its first case on January 25, 2020, and it also recorded three digit case numbers on March 15, 2020. Malaysia's government has taken steps to implement more and varied strategies to stop the number of cases from snowballing. The Malaysian government implemented the Movement Control Order (MCO) to limit people's movements three days later. Although, many businesses were not permitted to operate, essential industries were still allowed to operate under this MCO. With the slogan "stay home, stay safe," Malaysians had no choice, unfortunately they needed to stay at home to try to mitigate the spreading of the COVID-19 virus. The government also implemented the PRIHATIN Rakyat Economic Stimulus Package by providing one-off cash assistance, a loan moratorium, and many more forms of assistance to ease Malaysians' financial burdens.

The existence of the COVID-19 virus also enhanced people's awareness about the importance of contactless transactions. A few months of living under the MCO also indirectly changed the lifestyle of Malaysians, causing them to have more contactless transactions. Under these circumstances, the e-wallet became the first choice for such transactions. The e-wallet also enables the seller to receive payments from the consumers using a two-dimensional quick-response (QR) code. This helps the seller prevent the payment from being stolen or lost (Subaramaniam et al., 2020). In terms of e-wallet's usage, Malaysia also leads the other ASEAN countries by having 40% usage (Nortajuddin, 2020). According to the central bank (BNM),

Malaysia also achieved 1.659 billion e-wallet transactions with a total value of RM 26.3 billion, as of November 2020.

To date, there are 48 e-wallet service providers in Malaysia. E-wallets can also be accessed via various advertisements in restaurants, shopping malls, or even roadside stalls in Malaysia. Meanwhile, the e-wallet service providers have also introduced some different reward schemes to boost the number of users. During the first quarter of 2020, the Malaysian government gave out a one-off RM 30 e-Tunai Rakyat incentive to encourage Malaysians spend with e-wallets. The Malaysian government gave out total incentives of RM 450 million to nearly 15 million Malaysians between January 15, 2020 to March 14, 2020 (Sharon, 2020). Notably, some incentives were distributed through the three dominant e-wallet providers in Malaysia, namely Boost, GrabPay, and Touch 'n Go.

In June 2021, the Malaysian government also introduced the RM 50 e-Penjana incentive to encourage Malaysians to use e-wallets during the COVID-19 pandemic. This incentive was channeled to nearly 15 million eligible Malaysians through the three major e-wallets. In order to qualify for the e-Penjana incentive, Malaysians were required to register for the MySejahtera application. Besides that, to be eligible, the applicants also had to be aged 18 and above with an annual income of less than RM100,000, based on the current records of the Inland Revenue Board (LHDN) (Yeoh, 2020). To some extent, the e-Penjana incentive attracted a certain number of new users. This also shed light on the impact of government support for e-wallets.

Many researchers have confirmed that several factors, such as the perceived usefulness and ease of use, were significantly related to usage of e-wallets (Liu & Tai, 2016;

Pertiwi et al., 2020). This paper intends to fill the knowledge gap by including the perceived usefulness, government support, the perceived risk, and social influence as potential factors to encourage new users to adopt e-wallets. Thus, this study has been conducted to empirically, (i) analyze the impact of the perceived usefulness, the perceived risk, government support, and social influence on people's attitude toward e-wallets, (ii) analyze the associate between their attitude toward e-wallets and intention to use an e-wallet, and (iii) analyze the moderating effect of age and gender on the relationship between the potential factors and the attitude toward e-wallets. The following section of this study reviews the relevant theories and findings of existing studies into e-wallets' usage in different countries. This is followed by a description of the data collection process and the research method used. The subsequent section presents the result of various analyses, together with the discussions. Lastly, the conclusion and recommendations for future research are presented.

Literature Review

Theoretical Foundation

This section starts with discussions about the technology acceptance mod-el (TAM), the theory of reasoned action (TRA), and the theory of planned behavior (TPB). TAM was developed by Davis (1989) based on the TRA. The TRA hypothesized that an individual's behavioral intention is determined by their attitude and subjective norms (as illustrated in Figure 2.1). Whereas TAM assumed that acceptance of a new technological product is due to its usefulness and easiness (as illustrated in Figure 2.2). However, these two variables cannot effectively capture the core belief that affects users' attitudes toward technological products (Jaradat, 2013).

Although TAM has been widely used in previous studies, it has also received criticism for its perceived characteristics of being over-simplistic. TAM also does not provide significant determinants for the latest technological products (Do & Do, 2020; Sharma, 2019). On the other hand, the TPB can explain human behavior during various activities, including the usage of information technology. The TPB upholds that a consumer's intention to perform various forms of behavior can be accurately predicted using attitudes, social influence, and perceived behavioral control (as illustrated in Figure 2.3) (Ajzen, 1991). The TPB shows that a person's real behavior in performing such acts is affected explicitly by their behavioral purpose (Zhang et al., 2019). In other
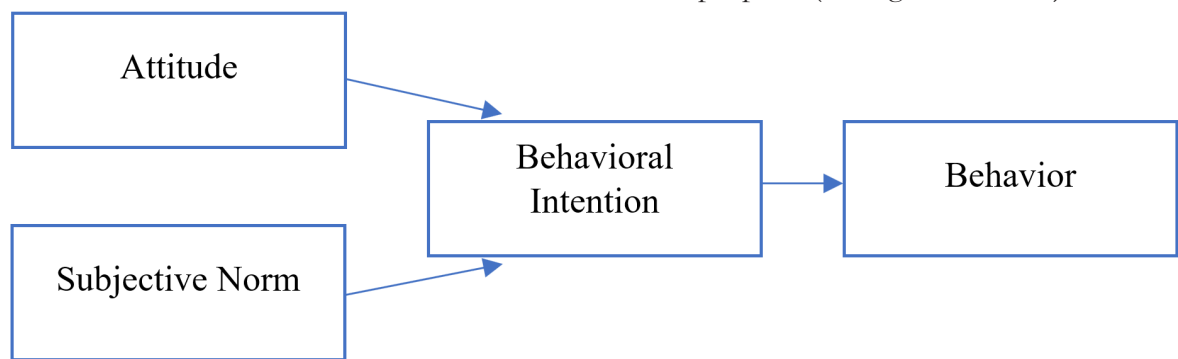

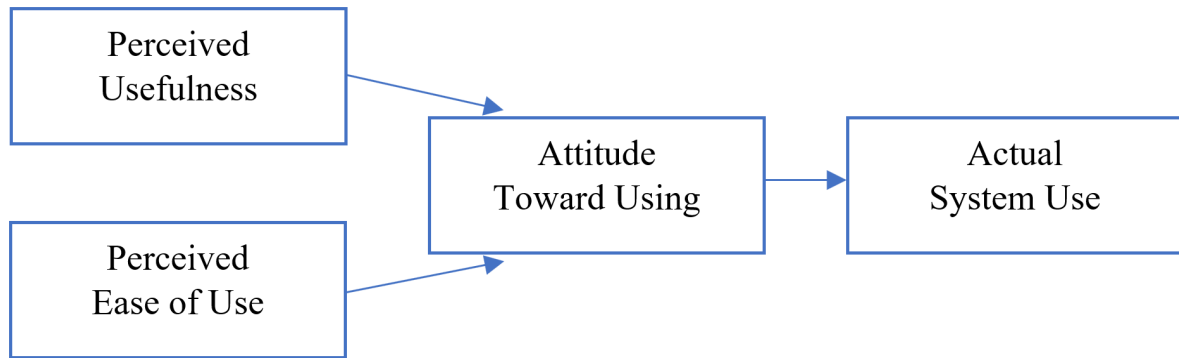**Figure 2.1**. Theory of Reasoned Action (TRA)

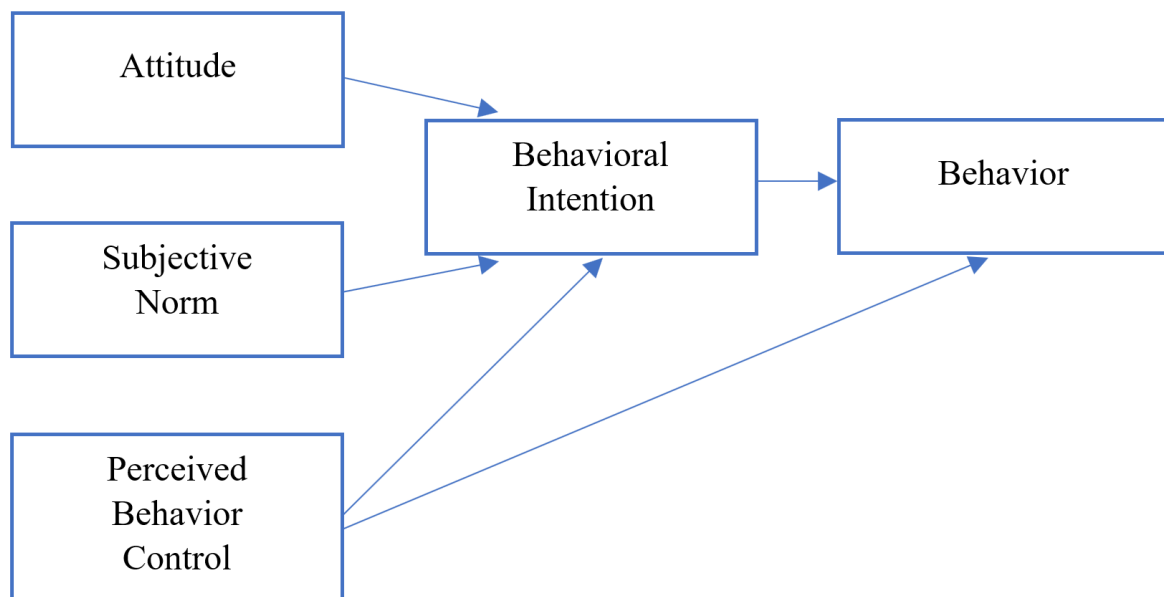**Figure 2.2**. Technology Acceptance Model (TAM)

Figure 2.3. Theory of Planned Behavior (TPB)

words, the TPB also forecasts the interest or purpose of consumers in carrying out a specific action. Besides that, an optimistic or unfavorable attitude directly impacts the strength of the behavioral perceptions on the possible salient results. Over the past decade, several studies have integrated the TPB with TAM to capture more potential factors that affect users' behavioral intentions to use a particular technological product, including mobile banking (Alsamydai, 2014; Leiva et al., 2017), e-commerce (Fayad & Paper, 2015), e-government (Elkheshin & Saleeb, 2020; Nguyen et al., 2020), and e-learning (Al-Emran & Teo, 2020; Saleh, 2019).

As such, this study had probed into several constructs of users' intentions to adopt the e-wallet through the lens of the TPB, to better explain their intention as the mediating variable of e-wallet's adoption. This study incorporated the TPB into TAM to examine any of the possible variables which may impact on Malaysians' adoption of e-wallets during the COVID-19 pandemic. Thus, this study's conceptual framework includes three different potential factors, namely the perceived risk, the social influence, and government support. The following section dis-

cusses the existing literature as related to the factors that have an impact on the adoption of e-wallets.

Perceived Usefulness

The perceived usefulness (PU) can also be interpreted as the degree to which the users believe that a specific system can enhance their performance (Davis, 1989). As a result, consumers feel that adopting such a system will enable them to achieve their financial and lifestyle goals, while also boosting the efficiency with which they complete various transactions. TAM also shows that the acceptance of technological products is influenced by the individual's attitude toward using it. In turn, an individual's attitude toward using the technological product is influenced by its perceived usefulness (PU) and perceived ease of use (PEOU).

Additionally, it has been demonstrated that PU has a beneficial effect on the attitude toward using e-wallets, followed by the intention of using them (Shankar & Datta, 2018; To & Trinh, 2021; Yang et al., 2021). This usefulness may be enhanced by augmenting additional services to make users enjoy using e-wallets as an alternative payment method, particularly in order to contain the spread of COVID-19. Previous studies revealed that some users would only use an e-wallet when they could see its usefulness. For instance, the viewpoint of usefulness also attracted the Generation Y of India and Indonesia to adopt e-wallets (Liu & Tai, 2016; Pertiwi et al., 2020). Undoubtedly, the existing e-wallet does facilitate various functions. For instance, users can pay their bills without stepping out of their house. Some e-wallet providers have also embedded the ability to have food delivered in their e-wallets. E-wallets with more

significant benefits may also encourage consumers to use them more frequently (Lwoga & Lwoga, 2017).

Taufan and Yuwono (2018) investigated the factors influencing Indonesia's commonly used e-wallets, such as the GO-Pay. More than 79% of Indonesians used GoPay for their everyday transactions. Their findings showed that PU is positively associated with the use of GoPay. A similar study was also conducted by Nag and Gilitwala (2019) in Thailand. Similarly, they also revealed that PU appears to attract more users. Recently, Karim et al., (2020) investigated some of the factors that affect young Malaysian adults' adoption of e-wallets. However, the respondents of this study only consists of undergraduates in the Klang Valley. Although the researchers revealed that PU tends to impact e-wallet's usage positively, this result may not be generalized as being the decision of all young Malaysian adults. They also stated that young adults' preferences could differ depending on their financial situation. Based on the reviews, this study hypothesizes that PU is positively related to the usage of e-wallets.

Hypothesis 1: Perceived usefulness is positively related with the attitude toward using e-wallets.

Perceived Risk

The COVID-19 pandemic has changed the lifestyle of many people and this has led to the new normal. People started to take more precautionary steps to prevent themselves from being infected with COVID-19. The virus transmission occurs mainly through respiratory droplets and fomites. This has raised fears that the virus may also exist on, and be spread by handling, banknotes and

coins (Pal & Bhadada, 2020). However, one of the preventive steps involves social distancing, which also pushed some individuals to use digital payment apps (Undale et al., 2020) despite the fact that there have been no COVID-19 cases reported due to the transmission of the virus through handling cash. The use of e-wallets is also the best way to avoid the possibility of COVID-19 transmission (Aji et al., 2020). In such circumstances, consumers may switch to a cashless payment mode.

The theory of perceived risk also states that perceived risk could be defined in two major ways, (i) the probability of loss and (ii) the subjective feeling of unfavorable consequences (Mitchell, 1992). Perceived risk (PR) refers to the perception toward the adverse impacts or consequences resulting from the specific service used (Featherman & Pavlou, 2003). Some previous studies also tested different dimensions of PR toward technological products. For instance, Kim et al., (2008) revealed that PR has a major impact on the users' decisions in online shopping. Lee (2009) also revealed that a greater PR appears to decrease users' interest in internet banking's adoption. On the other hand, Cheng et al., (2013) assumed that young adults' had different risk perceptions and actions toward different payment methods in Malaysia. Definitely, they also discovered that cash transactions would be safer than e-payments for young Malaysian adults. However, they observed that young adults' interpretations would vary according to the size of the transaction. Unlike the previous studies, this study assumed the perceived risk to be any perception for the potential transmission of the COVID-19 virus. Additionally, a greater PR simply indicated that many respondents perceived that the COVID-19 virus might be transmitted through the use of cash. In conclusion, this study hypothesizes that a greater perceived risk (PR) might encourage potential users to use e-wallets.

Hypothesis 2: Perceived risk is positively related with the attitude toward using e-wallets.

Government Support

The government also plays a significant role in encouraging its citizens to use e-wallets. In January 2020, the Malaysian government announced the RM 30 e-wallet incentive to encourage Malaysians to adopt e-wallet technologies (Tan, 2020). The Malaysian government subsequently also provided additional incentives to encourage Malaysians to adapt to the cashless society by giving another RM 50 incentive during the COVID-19 pandemic (Cheong, 2020). One of the e-wallet providers in Malaysia, called "Boost" also reported an 85% increase in its users' spending at its registered merchants during the post-MCO period (Borneo, 2021). The "Howard–Sheth" consumer behavioral analysis theory may also explain this, as the theory states that an external factor usually acts as the stimuli for purchasing or consuming. Consumers always gather the related information and produce a variety of motivations based on their previous experiences (Howard & Sheth, 1969). Subsequently, they may refer to the information collected and then decide their usage or purchase of a particular product. There is a dearth of studies that provide evidence for the relationship between government support and e-wallets. As such it is hypothesized that government support is positively related to the usage of e-wallets.

Hypothesis 3: Government support is positively related with thee attitude toward using e-wallets.

Social Influence

The social influence theory is a well-established theory explaining individuals' social conduct with their identities (Kelman, 1958; Becker et al., 1995). This theory illustrates how various commitment processes alter one's attitude toward a specific behavior. Compliance, identification, and internalization are three types and levels of social commitment identified by this theory. Compliance, for example, happens when a person accepts influence, hoping to elicit a good response from another person or group through a normative commitment. When system users adopt actions to achieve a gratifying and self-defining relationship with another person or group with an affective commitment, this is referred to as identification. Internalization occurs when system users adopt behavior aligned with their ideals and are motivated by intrinsic motivation. These social influence elements alter a person's belief framework, causing him/her to react to potential social status gains (Eliedit-cosaque, 2012; Tsai and Bagozzi, 2014).

Im et al., (2011) stated that social influence (SI) has an impact on the public's views about whether they should support an innovation. From the perspective of young consumers, SI specifically refers to the views of their peers (Tan et al., 2020). To some extent, some consumers consider their peers' expectations to be a guide and act accordingly (Crespo et al., 2009). In addition, SI is also the most tested variable related to the usage of e-wallets. Numerous studies also confirm the positive impact between SI and the usage of e-wallets in various countries, including India (Gupta, 2017), Malaysia (Chua et al., 2020), and Thailand (Nag & Gilitwala, 2019). The public will be more likely to adopt e-wallets when they think they can help them make contact with others. In this study it is thus hypothesized that SI is positively related with the usage of e-wallets.

Hypothesis 4: Social influence is positively related to the attitude toward using e-wallets.

Attitudes And Intention of Use

TAM emphasizes the link between attitude and intention. This model implies that attitude functions as an evaluative propensity to behavior. The attitude toward e-wallets has traditionally been defined as how an individual senses a good or negative emotion associated with them (Gbongli et al., 2019). Past research into TAM and other consumer-related topics has established a relationship between attitudes and intentions (Yousafzai et al., 2007; Yang & Jolly, 2009). Numerous studies have demonstrated that consumers who favor certain technological products are more likely to use them (Marangunic & Granic, 2015; Tao et al., 2018). Indeed, previous research has established that attitude is the strongest predictor of the intention to utilize technological products in the original TAM (Teo & Zhou, 2014; Wu & Chen, 2017). Based on these discussions, this study has generated the following hypothesis.

Hypothesis 5: The attitude toward e-wallets is positively related with the intention of using e-wallets.

Moderating Role of Age and Gender

In addition, this study attempts to examine the role of age and gender as moderators. Some previous studies have consistently found that different demographic characteristics, including gender and age, have a significant impact on consumers' decision-making (Hwang & Choi, 2018; Lian & Yen, 2014).

Further, Belanche et al., (2020) also mentioned that age and gender are intrinsic factors that will impact consumers' behavior in their use of technological products or digital devices. The information processing theory states that elderly consumers have a limited capacity for information processing, and make judgments using heuristics (Bettman, 1979). As a result, elderly consumers are usually less effective at seeking new information about a product. They also have a limited range of considerations compared to the younger generations (Sugianto, 2017). On the other hand, gender distinctions usually arise as a result of psychological differences (Zhang et al., 2007). In the context of technological products, women typically have a higher level of technological anxiety, but men are more inclined to be innovative with new technology (Lee et al., 2010; Saxena, 2018). Thus, one strategy to meet customers' needs is to recognize the disparities in terms of age and gender. Based on the preceding discussion, this study hypothesizes that age and gender moderate the relationship between the potential factors and e-wallets' usage.

Hypothesis 6: Age moderates the relationship between the potential factors and the attitude toward using e-wallets.

Hypothesis 7: Gender moderates the relationship between the potential factors and the attitude toward using e-wallets.

Data and Methodology

Construct Measurement

The research model consisted of five constructs including e-wallets' usage, perceived usefulness, perceived risk, government support, and social influence. In this study Google Forms was used to formulate the questionnaire. A pilot test was accordingly carried out on 30 respondents, who used e-wallets. The test served to review the questionnaire's design, sampling size, question effectiveness and the general feasibility of the study. Specifically, this questionnaire was formulated with 27 closed-ended questions. The questions were further split into two sections, Section A, and Section B. Section A comprised eight questions to collate the respondents' demographic information. Section B, with 19 questions, allowed the respondents to express their agreement or otherwise. The responses were measured on a five-point Likert scale, in which "1" and "5" represented that the respondents "strongly disagree" and "strongly agree" with the statements, respectively.

Data Collection

This study aimed to gather feedback from new e-wallet users in Malaysia. The term "new e-wallet user" referred to members of the Malaysian public who had just adopted e-wallets, following the COVID-19 pandemic. The purposive sampling method was applied in the study to select the targeted respondents. Prior to the distribution of the questionnaire, the minimum number of respondents was determined. According to Ramayah et al., (2011), this number should be five times the number of independent variables. Thus, 20 respondents were considered the minimum number of respondents for the study - four independent variables multiplied by five. The questionnaires were distributed through the social media platform, such as WhatsApp and Facebook over the period of June to December 2020. A total of 650 responses were collated from new users of e-wallets in Malaysia. From these, 598 re-

sponses were accepted for analysis as they had verified, completed questionnaires.

Method of Analysis

The model used in this study was tested for reliability and validity using three different indicators, including Cronbach's alpha, composite reliability, and average variance extracted (AVE). According to Khairul et al., (2018), Cronbach's alpha values that exceed 0.80 indicate an accurate measurement of the items. The convergent validity was also examined by AVE, using the factor loading from each construct. An AVE value that exceeded 0.5 was preferred (Fornell & Larcker, 1981). In addition, the discriminant validity was determined by comparing the square root of AVE and the intercorrelation between the constructs. The square root of AVE that exceeded the intercorrelation was preferable. This study also applied heterotrait-monotrait (HTMT) analysis to assess the discriminant validity. The HTMT ratio is supposed to be lower than the threshold of 0.85, to confirm the discriminant validity (Henseler et al., 2015). Once the convergent and discriminant validities were verified, the covariance-based structural equation modeling (CB-SEM) was conducted to investigate the relationship between the potential factors and the attitude toward the use of e-wallets. Subsequently, the relationship between the attitude toward using an e-wallet and the intention to use one during the COVID-19 pandemic was also investigated. The dependent variable applied in the estimation was the usage of an e-wallet during the COVID-19 pandemic. At the same time, the independent variables were the perceived usefulness, government support, perceived risk, and social influence. Lastly, the moderating impact of age and gender were tested.

Covariance-Based Structural Equation Modeling (CB-SEM)

The CB-SEM followed a maximum likelihood (ML) estimation procedure and targeted "reproducing the covariance matrix, without focusing on the explained variance" (Hair et al., 2011). Meanwhile, the R2 was a by-product of achieving a good model fit (Hair et al., 2014). CB-SEM was also appropriate for this research for theory testing and confirmation. Due to the nature of the confirmatory approach, CB-SEM required the specification of the full theoretical model before the data analysis began. The exact number of dependent and independent variables and the number of indicator variables required to ensure a valid and reliable measure of all constructs had to be determined (Mohamad et al., 2019). Specifically, CB-SEM required larger samples because the relationships between all the variables must be assessed. CB-SEM required a sample size of five times the number of indicators included in the original model. For instance, the CB-SEM model with 30 indicator variables on five constructs would require a sample size of 150 (5 x 30). The CB-SEM had two elements when evaluating and testing the measurement model. The first element was the inner model, which represented the structural path between the main construct in the model. Meanwhile, the second element was known as the outer model, which represented the relationship between the measurement model and the related indicator variable. CB-SEM also employed the maximum likelihood estimation (MLE) algorithm to generate superior results compared to the ones generated by the ordinary least squares (OLS) estimator (Claudia et al., 2014; Mohamad et al., 2019). Thus, this study used the AMOS software to run the CB-SEM for data analysis purposes.

Results

Table 1 summarizes the demographic information from the respondents. Most of the respondents were male (62.88%) and single (65.22%). The majority of the respondents were aged between 21 to 30 years old (70.74%), most of the respondents worked as employees (89.30%), and earned a salary between RM 1,000 and RM 2,000 (74.08%). Meanwhile, most of the respondents have applied for and received the e-Penjana incentive (81.10%).

ings ranged between 0.7823 and 0.9057. The factor loadings obtained were higher than the validity threshold of 0.5, as suggested by Hair et al., (2009). The result showed that the measurement items posed a high individual item reliability. The Cronbach's alpha values for all the items ranged from 0.7893 to 0.9332. Results of the analysis indicated that some measurements for the variables were reliable. The composite reliability (CR) and average variance extracted (AVE) values presented in Table 2 also exceeded the threshold level of between 0.5 and 0.7, as suggested by

Table 1. Demographic Information of the Respondents

Total Respondents: 598		Frequency	Percentage
Gender	Male	376	62.88%
	Female	222	37.12%
Marital Status	Single	390	65.22%
	Married	208	34.78%
Age (Years Old)	21 to 30	423	70.74%
	31 to 40	80	13.38%
	41 to 50	49	8.19%
	>51	46	7.69%
Occupation	Employee	534	89.30%
	Self-employed	34	5.69%
	Housewife	21	3.51%
	Retirees	9	1.51%
Income (RM)	1,000 to 2,000	443	74.08%
	2,001 to 3,000	57	9.53%
	3,001 to 4,000	47	7.86%
	> 4,000	51	8.53%
e-Penjana	Yes	485	81.10%
	No	113	18.90%

The summary statistics for the measurement items are presented in Table 2. On average, most of the respondents agreed with the statements for PU, followed by SI, GS, US, and PR. Table 2 also shows that an average scale for all the items ranged from 3.4682 to 4.1756. Most of the reported factor load-

Hair et al., (2009). These results were verified through the use of the convergent validity for the constructs.

As shown in Table 3, PU was positively correlated with all the variables, except for SI. A stronger relationship was shown between PU and US. This result was also supported

Table 2. Result of Descriptive Statistics, Convergent Validity and Discriminant Validity

Variable	Item	Mean	Standard Deviation	Factor Loadings	CA	CR	AVE
PU	PU 1	4.1020	1.0048	0.8619	0.9120	0.9212	0.7450
	PU 2	4.1756	0.9963	0.8620			
	PU 3	4.0067	1.0272	0.8705			
	PU 4	3.9699	1.0137	0.8582			
GS	GS 1	4.0702	1.0491	0.8127	0.9015	0.8968	0.6855
	GS 2	3.8244	1.0551	0.8066			
	GS 3	3.9766	0.9989	0.9046			
	GS 4	3.7074	1.0529	0.7827			
SI	SI 1	4.0220	1.0048	0.8812	0.7893	0.8800	0.7102
	SI 2	4.0162	0.9963	0.8615			
	SI 3	3.8211	0.9403	0.7823			
PR	PR 1	3.7960	1.0759	0.8850	0.9332	0.9280	0.7634
	PR 2	3.4682	1.1260	0.8096			
	PR 3	3.7358	1.1060	0.9057			
	PR 4	3.7826	1.0949	0.8914			
AT	AT 1	3.7341	1.1063	0.8722	0.8431	0.8880	0.7257
	AT 2	3.7809	1.0954	0.8751			
	AT 3	4.1003	1.0058	0.8066			
US	U 1	3.9615	1.0192	0.8642	0.9026	0.8858	0.7211
	U 2	3.9883	1.0361	0.8451			
	U 3	4.0017	1.0067	0.8381			

Table 3. Correlation Analysis and Discriminant Validity

	PU	PR	GS	SI	AT	US
PU	0.8631					
PR	0.6451	0.8737				
GS	0.7885	0.6441	0.8280			
SI	0.8181	0.5948	0.7200	0.8427		
AT	0.6985	0.7779	0.6709	0.6587	0.8519	
US	0.8255	0.6404	0.8026	0.7915	0.6689	0.8492

Table 4. Results of Heterotrait-Monotrait Ratio (HTMT)

	PU	PR	GS	SI
PU	0.815			
PR	0.839	0.652		
GS	0.648	0.693	0.513	
SI	0.670	0.741	0.550	0.705

by the conventional view of the technology acceptance model (TAM), which suggested that the usefulness of the e-wallet attracted more users to adopt it. On the other hand, GS and SI owned a strong correlation with US. This result also suggested that the gov-

Table 5. The Results between CB-SEM

Dependent variable:			
Independent Variable	**Coefficient**	**P-values**	**Decision**
PU → AT	0.117	0.057	Support
PR → AT	0.871	0.001	Support
GS → AT	0.499	0.069	Support
SI → AT	0.134	0.000	Support
AT → US	0.675	0.000	Support

Table 6. Result of Mediating Effect

	Coefficient	**p-value**	**Decision**
Moderating Impact on Age			
PU → AT	12.527	0.843	No Moderation
PR → AT	9.388	0.658	No Moderation
GS → AT	19.756	0.466	No Moderation
SI → AT	22.483	0.700	No Moderation
Moderating Effect of Gender			
PU → AT	0.160	0.055	Moderation
PR → AT	0.008	0.765	No Moderation
GS → AT	0.009	0.824	No Moderation
SI → AT	0.222	0.004	Moderation

ernment played a significant role through its impact on new users' intentions to use an e-wallet. A relatively weaker relationship was shown between PR and US. Higher perceived risk tended to encourage new users to adopt an e-wallet. In contrast, PR displayed a weaker correlation with US and the other variables. Notably, the square root of AVE was greater than all the intercorrelations between the constructs. As shown in Table 4, all the HTMT ratios were below the threshold of 0.85. This result confirmed that there was no discriminant validity problem between all the constructs.

Table 5 presents the results of the covariance-based structural equation modeling (CB-SEM). PU and GS were significantly and positively related with the attitude toward e-wallets, at the level of 10%. Whereas, PR and SI were significantly and positively related with the attitude toward e-wallets at the level of 5%. The findings supported Hypothesis 1 to Hypothesis 4. From the results we can thus accept that the attitude toward e-wallets was also significantly and positively related with the intention of using e-wallets during the COVID-19 pandemic. Hypothesis 5 was also supported. This study also tested the moderating impact of age and gender on the relationship between the potential factors with the attitude toward e-wallets. The result in Table 6 suggested that the age factor did not show any mediating impact on the relationship between the potential factors and the usage of e-wallets. Thus, Hypothesis 6 was not supported. However, gender showed a mediating impact on the association of perceived usefulness and social influence and attitude toward e-wallets. Hypothesis 7 was thus partially supported.

Discussion

This study explored the factors that affect the intention of using an e-wallet during the COVID-19 pandemic. This study verified the significantly positive impacts of PU, PR, GS, and SI upon the attitude toward e-wallets. Similar with the previous findings of Liu and Tai (2016) and Pertiwi, Suprapto, and Pratama (2020), this study asserted that the usefulness of an e-wallet is crucial to intensify the attitude toward e-wallets during the COVID-19 pandemic. There are many functions available in an e-wallet that can help the user perform different types of transactions, such as paying utility bills, telephone bills, and ordering food. This may also explain the phenomena of the spike in e-wallet transactions in 2020. As a result, users would consider e-wallets to be a useful payment method and use them repeatedly in the future. Therefore, the provision of multifaceted knowledge to potential users about e-wallets is essential to highlight the usefulness of an e-wallet.

Undoubtedly, implementing the MCO had changed the lifestyle of Malaysians. In order to reduce the infection risk of COVID-19, the public tried their best to avoid unnecessary gatherings, practiced social distancing, and maintained increased levels of hygiene. People also practiced the concept of "stay at home," "social distancing," and "cashless spending." The term perceived risk in this study referred to the perception of the potential transmission of the COVID-19 virus. This study showed that the high perceived risk toward the usage of cash was positively associated with the attitude toward e-wallets during the ongoing COVID-19 pandemic.

The Malaysian government also introduced various forms of incentives for e-wallet users during the COVID-19 pandemic. Indeed, the findings also confirmed that government support helped to speed up the formation of a cashless society in Malaysia. On the other hand, this study supported the findings of Gupta (2017) and Chua et al., (2020) that social influence triggered Malaysians to present a positive attitude toward e-wallets. Thus, an individual's perspective or view tended to influence their friends or family members to use an e-wallet during the pandemic. The findings suggest that it is vital to raise the public's awareness that an e-wallet is compatible with the user's needs and lifestyle under the prevailing uncertain circumstances.

The findings importantly confirm that a positive attitude toward e-wallets is also positively linked with the intention of using e-wallets during the COVID-19 pandemic. Lastly, this study supports earlier findings that gender displays a partial moderation to strengthen the relationship between the potential factors and the attitude toward e-wallets. Hence, the gender of the users can affect the usage of e-wallets. In summary, the outcomes of this study show that the integration of the TPB and TAM is able to capture the potential factors that affect the attitude toward using e-wallets. Following the assumption of the TPB and TAM, the attitude toward e-wallets is proven to have a significant relationship with the intention of using e-wallets during the COVID-19 pandemic. Thus, service providers need to make sure the reliability and safety of their e-wallet payment systems are well-maintained. This assurance tends to motivate users to choose e-wallets as their preferred payment method during the COVID-19 pandemic.

Conclusion

In this study, four potential factors that affect the usage of e-wallets in Malaysia

during the COVID-19 pandemic were tested. Purposive sampling was applied to gather responses from new users of e-wallets. Due to the COVID-19 pandemic, only an online survey could be carried out. Using the covariance-based structural equation modeling (CB-SEM), this study can confirm that all the four potential factors are positively related to the users' attitudes toward e-wallets. The result is consistent with those from past studies regarding perceived usefulness and social influence, which are positively related to attitudes toward e-wallets. In addition, the perceived risk and government support further encouraged Malaysians to use e-wallets during the COVID-19 pandemic. These endeavours helped to accelerate the formation of a cashless society in Malaysia. Future studies are recommended to apply the survey and interview methods to further elucidate on users' attitudes toward e-wallets. This study also recommends that the government collaborates with e-wallet providers to offer more incentives in the future, in order to attract new users. The findings of this study may also serve as guidelines for e-wallet providers to implement effective strategies for this purpose.

Limitation

This section discusses the shortcomings of this study. First, the majority of the respondents were young, aged between 20 and 30 years old. As such the results obtained may not reflect the perceptions of all Malaysians, particularly during the COVID-pandemic. Second, the generalization of some results may improve by increasing the sampling size. Third, the perceived risk factor may not fully capture the public perception of the possibility of the COVID-19 virus being transmitted by handling coins or banknotes. There is also a lack of relevant studies that employ survey questions relating to perceived risk. Fourth, several potential factors, such as rewards and advertisements, need to be embedded in future studies. Nevertheless, this research area is considered to be a relatively new one and more studies are needed to investigate the potential factors affecting the usage of e-wallets during the prevailing conditions caused by the COVID-19 pandemic.

References

Aji, H. M., Berakon, I., & Husin, M. M. (2020). COVID-19 and e-wallet usage intention: a multigroup analysis between Indonesia and Malaysia. Cogent Business and Management, 7, 1–16.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50, 179–211.

Al-Emran, M., & Teo, T. (2020). Do knowledge acquisition and knowledge sharing really affect e-learning adoption? An empirical study. Education and Information Technologies, 25(2), 1983–1998.

Alsamydai, M. J. (2014). Adaptation of the technology acceptance model (TAM) to the use of mobile banking services. International Review of Management and Business Research, 3(4), 2039–2051.

Belanche, D., Flavián, M., & Pérez-Rueda, A. (2020). Mobile apps use and WOM in the food delivery sector: the role of planned behavior, perceived security and customer lifestyle compatibility. Sustainability, 12(4275), 1–21.

Becker, T. B. Randall, M., Riegel, D. C. (1995). The multidimensional view of commitment and the theory of reasoned action: a comparative evaluation. Journal of Management, 21(4), 617-638.

Bettman, J. R. (1979). Memory factors in consumer choice: a review. Journal of Marketing, 43(2), 37-53.

Borneo, P.O. (2021). Boost records strong increase in GTV post-MCO. Retrieved 5 January, from https://www.theborneopost.com/2020/08/31/boost-records-strong-increase-in-gtv-post mco.

Cheng, A. Y., Hamid, N. R. A., & Cheng, E. H. (2013). Risk perception of the E-payment systems: a young adult perspective. WSEAS Transactions on Information Science and Applications, 1(10), 26–35.

Cheong, A. (2020). Government to provide RM50 digital incentive for E-wallet users, matched with additional RM50 vouchers. Retrieved 5 January, from https://ringgitplus.com/en/blog/e-wallet/government-to-provide-rm50-digital-incentive-for-e-wallet-users-matched-with-additional-rm50-vouchers.html.

Chua, C. J., Lim, C. S., & Khin, A. A. (2020). Consumers' behavioural intention to accept of the mobile wallet in Malaysia. Journal of Southwest Jiaotong University, 55(1), 1–13.

Claudia, B. A., Patel, V. K., & Wanzenried, G. (2014). A comparative study of CB-SEM and PLS-SEM for theory development in family firm research. Journal of Family Business Strategy, 5, 116-128.

Crespo, A. H., Del Bosque, I. R., & Sanchez, M. M. G. D. L. S. (2009). The influence of perceived risk on Internet shopping behavior: A multidimensional perspective. Journal of Risk Research, 12(2), 259–277.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340.

Do, N. B., & Do, H. N. T. (2020). An investigation of generation Z's intention to use electronic

wallet in Vietnam. Journal of Distribution Science, 18(10), 89–99.

Elie-dit-cosaque, C., Pallud, J., & Kalika, M. (2012). The influence of individual, contextual, and social factors on perceived behavioral control of information technology: a field theory approach. Journal of Management Information Systems, 28(3), 201-234.

Elkheshin, S., & Saleeb, N. (2020). Assessing the adoption of E-government using TAM model: case of Egypt. International Journal of Managing Information Technology, 12(1), 1–14.

Fayad, R., & Paper, D. (2015). The technology acceptance model E-commerce extension: a conceptual framework. Procedia Economics and Finance, 26, 1000–1006.

Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: a perceived risk facets perspective. International Journal of Human Computer Studies, 59, 451–474.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1), 39–50.

Gbongli, K., Xu, Y., & Komi, M. A. (2019). Extended technology acceptance model to predict mobile-based money acceptance and sustainability: a multi-analytical structural equation modeling and neural network approach. Sustainability, 11(3639), 1-33.

Gupta, V. (2017). A study on consumer adoption of mobile wallet. International Journal of Trade &Commerce, 6(1), 57–70.

Hair, J. F. J., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). Multivariate Data Analysis (7th ed.). Pearson Prentice Hall.

Hair, J. F., Celsi, M., Money, A., & Samouel, P., & Page, M. (2011). Essentials of business research methods (2nd ed.). Armonk, NY: ME Sharpe.

Hair, J. F., Hult, G. T. M. Ringle, C. M., & Sarstedt, M. (2014). A primer on partial least squares structural equation modeling (PLS-SEM). Thousand Oaks: Sage.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115-135.

Howard, J. A., & Sheth, J. N. (1969). The Theory of Buyer Behavior. John Wiley & Sons.

Hwang, J., & Choi, J. K. (2018). An investigation of passengers' psychological benefits from green brands in an environmentally friendly airline context: the moderating role of gender. Sustainability, 10(80), 1–17.

Im, I., Hong, S., & Kang, M. S. (2011). An international comparison of technology adoption: Testing the UTAUT model. Information and Management, 48, 1–8.

Jaradat, M. I. R. (2013). Applying the technology acceptance model to the introduction of mobile voting. International Journal of Mobile Learning and Organisation, 7(1), 29–47.

Karim, M. W., Haque, A., Ulfy, M. A., Hossain, M. A., & Anis, M. Z. (2020). Factors influencing the use of E-wallet as a payment method among Malaysian young adults. Journal of International Business and Management, 3(2), 1–12.

Kelman, H. C. (1958). Compliance, identification, and internalization: three processes of attitude change. Journal of Conflict Resolution, 2, 51-60.

Khairul, M. D. A., Khidzir, N. Z., Ismail, A. R., & Abdullah, F. A. (2018). Validity and reliability of instrument to measure social media skills among small and medium entrepreneurs at Pengkalan Datu River. International Journal of Development and Sustainability, 7(3), 1026–1037.

Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: the role of trust, perceived risk, and their antecedents. Decision Support Systems, 44, 544–564.

Lee, M. C. (2009). Factors influencing the adoption of internet banking: an integration of TAM and TPB with perceived risk and perceived benefit. Electronic Commerce Research and Applications, 8, 130–141.

Lee, H. J., Cho, H. J., Xu, W., & Fairhurst, A. (2010). The influence of consumer traits and demographics on intention to use retail self-service checkouts. Marketing Intelligence & Planning, 28(1), 46-58.

Leiva, F. M., Climent, C. S., & Cabanillas, L. F. (2017). Determinants of intention to use the mobile banking apps: an extension of the classic TAM model. Spanish Journal of Marketing - ESIC, 21(1), 25–38.

Lian, J. W., & Yen, D. C. (2014). Online shopping drivers and barriers for older adults: age and gender differences. Computers in Human Behavior, 37, 133–143.

Liu, G.-S., & Tai, P. T. (2016). A Study of Factors Affecting the Intention to Use Mobile Payment Services in Vietnam. Economics World, 4(6), 249–273.

Lwoga, E. T., & Lwoga, N. B. (2017). User acceptance of mobile payment: the effects of user-centric security, system characteristics and gender. Electronic Journal of Information Systems in Developing Countries, 81(3), 1–24.

Marangunic, N., & Granic, A. (2015). Technology acceptance model: a literature review from 1986 to 2013. Universal Access in the Information Society, 14, 81-95.

Mitchell, V. W. (1992). Understanding consumers' behavior: can perceived risk theory help?. Management Decision, 30(3), 26-31.

Mohamad, M., Afthanorhan, A., Awang, Z., & Mohammad, M. (2019). Comparison between CB-SEM and PLS-SEM: testing and confirming the Maqasid Syariah quality of life measurement model. The Journal of Social Sciences Research, 5(3), 608-614.

Nag, A. K., & Gilitwala, B. (2019). E-Wallet- factors affecting its intention to use. International Journal of Recent Technology and Engineering, 8(4), 3411–3415.

Nguyen, H. T., Dang, T. V., Nguyen, V. V., & Nguyen, T. T. (2020). Determinants of e-government service adoption: an empirical study for business registration in Southeast Vietnam. Journal of Asian Public Policy, 12(1), 1–16.

Nortajuddin, A. (2020). E-wallet adoption on the rise in ASEAN. Retrieved 5 January, from-https://theaseanpost.com/article/e-wallet-adoption-rise asean.

Pal, R., & Bhadada, S. K. (2020). Cash, currency and COVID-19. Postgraduate Medical Journal, 96(1137), 427–428.

Pertiwi, D., Suprapto, W., & Pratama, E. (2020). Perceived usage of E-wallet among the Y generation in Surabaya based on technology acceptance model. Jurnal Teknik Industri, 22(1), 17–24.

Ramayah, T., Lee, J. W. C., & Julie, B. C. I. (2011). Network collaboration and performance in the tourism sector. Service Business, 5(4), 411–428.

Saleh, A. N. (2019). Extend of TAM model with technology anxiety and self-efficacy to accept course websites at University Canada West. International Journal of Information Technology and Language Studies, 3(2), 1–7.

Saxena, S. (2018). Role of perceived risks in adopting mobile government (m-government) services in India. Foresight, 20(2), 190-205.

Sharma, S. K. (2019). Integrating cognitive antecedents into TAM to explain mobile banking behavioral intention: A SEM-neural network modeling. Information Systems Frontiers, 21(4), 815–827.

Sharon, A. (2020). Malaysia govt hands out RM450 million. Retrieved 5 January, fromhttps://opengovasia.com/malaysia-govt-hands-out-rm450-million-to-boost-etransactions.

Shankar, A., & Datta, B. (2018). Factors affecting mobile payment adoption intention: an Indian perspective. Global Business Review, 19, 72-89.

Subaramaniam, K., Kolandaisamy, R., Jalil, A. Bin, & Kolandaisamy, I. (2020). The impact of E-Wallets for current generation. Journal of Advanced Research in Dynamical and Control Systems, 12(1), 751–759.

Sugianto, D. K. (2017). The moderating effect of age, income, gender, expertise, loyalty program, and critical incident on the influence of customer satisfaction towards customer loyalty in airline industry: a case of PT. X. iBuss Management, 5(1), 70-83.

Tan, J. (2020). RM30 e-Tunai rakyat E-wallet initiative : what you need to know. Retrieved 5 January, fromhttps://ringgitplus.com/en/blog/e-wallet/rm30-e-tunai-rakyat-e-wallet-initiative-what-you-need-to-know.

Tan, O. K., Fatinsyakila, A. A., Ong, C. H., Goh, C. F., Lim, K. Y., Mohd, S. I. B. S., & Choi, S. L. (2020). E-wallet acceptance among undergraduates in Malaysia. Test Engineering and Management, 83, 12990–12998.

Tao, D., Yuan, J., Shao, F., Li, D., Zhou, Q., & Qu, X. (2018). Factors affecting consumer acceptance of an online health information portal among youth internet users. CIN: Computers, Informatics, Nursing, 36(11), 530-539.

Taufan, A., &, & Yuwono, R, T. (2018). Analysis of factors that affect intention to use e-Wallet through the technology acceptance model approach (Case Study : GO-PAY). International Journal of Science and Research, 8(7), 413–419.

Teo, T., & Zhou, M. (2014). Explaining the intention to use technology among university students: a structural equation modeling approach. Journal of Computing in Higher Education, 26, 124-142.

To, A. T., & Trinh, T. H. M. (2021). Understanding behavioral intention to use mobile wallets in Vietnam: extending the TAM model with trust and enjoyment. Cogent Business and Management, 8(1), 1-14.

Tsai, H., & Bagozzi, R. (2014). Contribution behavior in virtual communities: cognitive, emotional, and social influences. MIS Quarterly, 38(1), 143-163.

Undale, S., Kulkarni, A., & Patil, H. (2020). Perceived eWallet security: impact of COVID-19 pandemic. Vilakshan - XIMB Journal of Management, 1–16.

Wu, B., & Chen, X. (2017). Continuance intention to use MOOCs: integrating the technology acceptance model (TAM) and task technology fit (TIF) model. Computer Human Behavior, 67, 221-232.

Yang, Y., & Tan, Z. (2019). Investigating the influence of consumer behavior and governmental policy on the diffusion of electric vehicles in Beijing, China. Sustainability, 11(6967), 1-20.

Yeoh, A. (2020). ePenjana: remember to claim your RM50 e-wallet credit before 24 September. Retrieved 5 January, from https://www.thestar.com.my/tech/tech-news/2020/09/03.

Zhang, L., Fan, Y., Zhang, W., & Zhang, S. (2019). Extending the theory of planned behavior to explain the effects of cognitive factors across different kinds of green products. Sustainability, 11(4222), 1–17.

Zhang, X., Prybutok, V. R., & Strutton, D. (2007). Modeling influences on impulse purchasing behaviors during online marketing transactions. Journal of Marketing Theory and Practice, 15(1), 79-89.