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FACTORS INFLUENCING THE INTENTION TO USE CRYPTOCURRENCY AMONG USERS IN MALAYSIA

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ABSTRACT

Purpose – Cryptocurrency has become an important infrastructure for purchasing, transferring money, paying bills and other services. The rising cryptocurrency interest in remittance and payments made it a formal financial transaction in some countries. The purpose of this study is to examine the behavioural intention of Malaysian users in using the method.

Design/Methodology/Approach – The authors modeled the behavioral intention using the Unified Theory of Acceptance and Use of Technology (UTAUT) model and perceived risk theory to employ the modelling. The proposed conceptual model demonstrates the significant role of performance expectancy, effort expectancy, social influence, financial risk and psychological risk toward behavioral intention to use cryptocurrency. To verify, SPSS and SmartPLS software were used to analyse the proposed conceptual model.

Findings – The results revealed new light to the existing literature on technology acceptance and usage of marketing, and provide industry practitioners with an understanding of the model toward behavioral intention to use cryptocurrency.

Originality/Value – In this study, the authors have proposed the conceptual framework based on the UTAUT model that determined the factors to use cryptocurrency among Malaysian users. The model can be standardised for the adoption of any fintech approach.

Keywords: Behavioural intention, Cryptocurrency, Perceived risk, User expectancy

1. Introduction

Cryptocurrency begin in 2008 from the blockchain technology uses distributed transaction ledger, with identical copies maintained on multiple computer systems controlled by different entities"(Antonopoulos, 2014). Cryptocurrencies are virtual currencies that are not backed up by any underlying asset, which have no intrinsic value and are not a liability to any entity (Arias-Oliva, Pelegrín-Borondo and Matías-Clavero, 2019). As stated by the World Economic Forum (2015) 10% of GDP will be stored in blockchain by 2027 with an average annual growth rate of 62.1% until 2025 (World Economic Forum, 2015).

1.1 Background

The payment system in Malaysia is still using centralised infrastructure payment methods have held steady despite the application of modern technologies, which makes the transaction

process costly and time-consuming (Norman, Shaw and Speight, 2011). Global non-cash transfer volumes increased gradually and the rise was driven by two countries: Evolving Asia with a 43.4 percent growth rate and CEMEA (Central Europe, Middle East and Africa) with a 16.4 percent annual growth (Report, 2017).

Malaysia is experiencing a significant rise in the remittance and payment industry and cryptocurrency interest and acts as a fence-sitting state. At the same time, the Malaysian government is on the fence-sitting in the view of cryptocurrency.

2. Literature Review

In 2008, Satoshi Nakamoto published a research paper on bitcoin. In his paper, he defined Bitcoin as a Peer-to-Peer Electronic Cash System. The core concept of the paper was about electronic money that does not require an intermediate bank to control the transaction among its peers (Nakamoto, 2008). Bitcoin is formed based on years of research on cryptography. There are so many cryptocurrencies available in the market today due to the fact that Blockchain is open-source, which allows the development of so many cryptocurrencies worldwide. The top cryptocurrency in the market is bitcoin, ethereum, litecoin and ripple.

2.1 *Empirical Study*

Many studies on the technology acceptance and adoption were conducted in many fields, using different models and theories like TRA, TPB, TAM, DOI, SCT, MM, MPCU and UTAUT. Through reading and searching in empirical studies that are performed around the world in the field of cryptocurrency acceptance/adoption. The following was summarised:

Country	2014	2015	2016	2017	2018	Total
Germany	1	1	1			3
Malaysia			1	1		2
Indonesia				1		1
Canada				1		1
USA		3	3	1		7
UK		1	3	2		6
Norway				1		1
Netherlands		1			1	2
Greece		1				1
Korea		1		1		2
Thailand	2					2
UAE	1					1
China	1				1	2
New Zealand				2		2
South Africa				1		1
TOTAL						34

Table 2.1: *Summary of Studies on adoption of cryptocurrency 2014 to 2018*

2.2 *Research Model and Hypotheses*

This research employs UTAUT as an underpinning theory with the integration of Perceived Risk Theory. At the same time, some variables were excluded from the based model of this research. The dependent variable (Use Behavior) was excluded as it's beyond the scope of this study since the main objective of this research is to study the factors influencing the users' behavioral intention toward using cryptocurrency and not the actual usage of cryptocurrency.

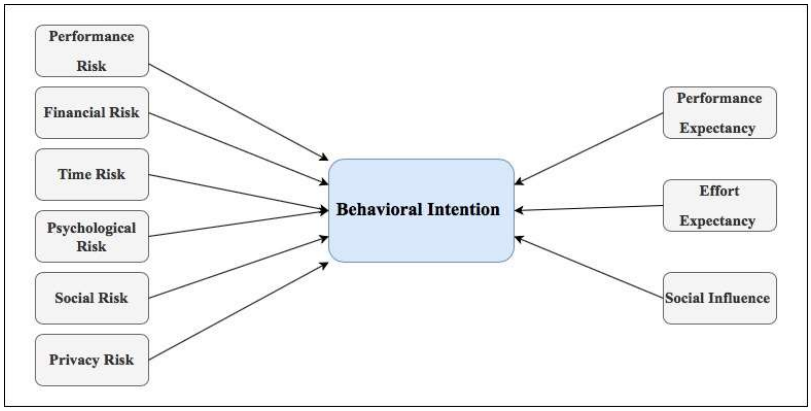

Figure 2.1: *Proposed Conceptual Model*

Hypothesis 1 (H1): *Performance Expectancy (PE) will have a positive effect on Behavioral Intention (BI)*

Hypothesis 2 (H2): *Effort Expectancy (EE) will have a positive effect on Behavioral Intention (BI)*

Hypothesis 3 (H3): *Social Influence (SI) will have a positive effect on Behavioral Intention (BI)*

The following tables summarised the relevant studies on performance expectancy, effort expectancy and social influence on behavioral intention.

Author / Year	**Context / Technology application**	**Hypothesis**	**Methodology**	**Findings**
(Gunawan and Novendra, 2017)	Indonesia / Bitcoin Acceptance	Performance Expectancy (PE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Regression ▪ Sampling: 49 Respondents	Sig.

(Eikmanns and Sandner, 2015)	Netherland / Bitcoin Acceptance	Performance Expectancy (PE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Regression ▪ Sampling: 369 Participants	Sig.
(Nseke, 2018)	China / Bitcoin Acceptance	Performance Expectancy (PE) → Behavioural Intention	▪ Qualitative Study ▪ Interview Method	Sig.
(Rahi et. al, 2018)	Malaysia / Internet banking	Performance Expectancy (PE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 398 Internet Banking Users	Sig.
(Alalwan et. al, 2017)	Jordan / Internet Banking	Performance Expectancy (PE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 348 Respondents	Sig.
(Bhatiasevi, 2016)	Thailand / Mobile banking	Performance Expectancy (PE) → Behavioural Intention	▪ Mixed Method Study ▪ Questionnaire + Interview Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling Interview: Experts (Bank Sector) ▪ Sampling Questionnaires: 272 Respondents	Sig.
(Kissi et. al, 2017)	Nigeria / Debit Card	Performance Expectancy (PE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Linear Regression ▪ Sampling: 400 Students	Sig.

Table 2.2: *Relevant Studies on Performance Expectancy*

Author / Year	**Context / Technology application**	**Hypothesis**	**Methodology**	**Findings**
(Gunawan and Novendra, 2017)	Indonesia / Bitcoin Acceptance	Effort Expectancy (EE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Regression ▪ Sampling: 49 Respondents	Not Sig.
(Eikmanns and Sandner, 2015)	Netherland / Bitcoin Acceptance	Effort Expectancy (EE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Regression ▪ Sampling: 369 Participants	Sig.
(Nseke, 2018)	China / Bitcoin Acceptance	Effort Expectancy (EE) → Behavioural Intention	▪ Qualitative Study ▪ Interview Method	Sig.
(Rahi et. al, 2018)	Malaysia / Internet banking	Effort Expectancy (EE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 398 Internet Banking Users	Sig.
(Alalwan et. al, 2017)	Jordan / Internet Banking	Effort Expectancy (EE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 348 Respondents	Sig.
(Bhatiasevi, 2016)	Thailand / Mobile banking	Effort Expectancy (EE) → Behavioural Intention	▪ Mixed Method Study ▪ Questionnaire + Interview Method	Sig.

			▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling Interview: Experts (Bank Sector) ▪ Sampling Questionnaires: 272 Respondents	
(Kissi et. al, 2017)	Nigeria / Debit Card	Effort Expectancy (EE) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Linear Regression ▪ Sampling: 400 Students	Not Sig.

Table 2.3: *Relevant Studies on Effort Expectancy*

Author / Year	**Context / Technology application**	**Hypothesis**	**Methodology**	**Findings**
(Gunawan and Novendra, 2017)	Indonesia / Bitcoin Acceptance	Social Influence (SI) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Regression ▪ Sampling: 49 Respondents	Sig.
(Eikmanns and Sandner, 2015)	Netherland / Bitcoin Acceptance	Social Influence (SI) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Regression ▪ Sampling: 369 Participants	Sig.
(Nseke, 2018)	China / Bitcoin Acceptance	Social Influence (SI) → Behavioural Intention	▪ Qualitative Study ▪ Interview Method	Sig.

(Rahi et. al, 2018)	Malaysia / Internet banking	Social Influence (SI) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 398 Internet Banking Users	Sig.
(Alalwan et. al, 2017)	Jordan / Internet Banking	Social Influence (SI) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 348 Respondents	Not Sig.
(Bhatiasevi, 2016)	Thailand / Mobile banking	Social Influence (SI) → Behavioural Intention	▪ Mixed Method Study ▪ Questionnaire + Interview Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling Interview: Experts (Bank Sector) ▪ Sampling Questionnaires: 272 Respondents	Sig.
(Kissi et. al, 2017)	Nigeria / Debit Card	Social Influence (SI) → Behavioural Intention	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Multiple Linear Regression ▪ Sampling: 400 Students	Sig.

Table 2.4: *Relevant Studies on Social Influence*

Author / Year	**Context / Technology application**	**Hypothesis**	**Methodology**	**Findings**
(Yang et. al, 2015)	China / Online Payment	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling, SEM ▪ Sampling: 159 Student	Sig.
(Lee, 2009)	Thailand / Internet Banking	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling, SEM ▪ Sampling: 368 Bank Users	Sig.
(Lian, 2015)	Taiwan / cloud-based e-invoice service	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling, SEM ▪ Sampling: 251 Responses	Sig.
(Chen, 2013)	Portugal / Internet banking	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR),	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM)	Sig.

		Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Sampling: 249 Responses	
(Martins et. al, 2014)	Taiwan / Mobile Banking Services	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 610 Respondents	Sig.
(Featherman and Pavlou, 2003)	USA / E-services Adoption	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: N/A	Sig.
(Luo et. al, 2010)	USA / Mobile Banking Services	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 122 Undergraduate Students	Sig.
(Mutahar et. al, 2017)	Yemen / Mobile Banking Services	Performance Risk (PR), Financial Risk (FR), Time Risk (TR),	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM)	Sig.

		Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Sampling: 483 Responses	
(Nguyen and Nguyen, 2017)	Vietnam / Online Banking	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 238 Respondents	Sig.
(Tandon et. al, 2018)	India / Online Shopping	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Quantitative Study ▪ Questionnaire Method ▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 500 Users of Online Shopping	Sig.
(Crespo et. al, 2009)	Spain / Internet Shopping	Performance Risk (PR), Financial Risk (FR), Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Qualitative Study ▪ Interview Method ▪ Analysis: Confirmatory Factor Analysis (CFA) ▪ Sampling: 10 Internet Experts	Sig.
(Biucky et. al, 2017)	Iran / Social Commerce Adoption	Performance Risk (PR), Financial Risk (FR),	▪ Quantitative Study ▪ Questionnaire Method	Sig.

		Time Risk (TR), Psychological Risk (PSYR), Social Risk (SR), Privacy Risk (PIR) → Behavioural Intention (BI)	▪ Analysis: Structural Equation Modelling (SEM) ▪ Sampling: 277 Active Users of Social Media	

Table 2.5: *Relevant Studies on Perceived Risk*

3. Research Methodology

Questionnaires were created to test the behavioral intention from the model and pass-through content validity and pilot study. The study used 496 respondents and validate using statistical tools and data analysis approaches.

3.1 Data collection

In this study, the respondents are account holders at Malaysian banks which offer Internet banking services. Selection is on the basis that they are not cryptocurrency users.

3.2 Measuring instrument

SPSS software is utilized for data entry, data screening, descriptive analysis, correlation, and factor analysis will be attained via the same software. However, measurement model, structural model and hypothesis testing with confirmatory factor analysis were undertaken using the SEM technique with SmartPLS.

4. Results

Test	**Results**
Cronbach's Alpha	All variables > 0.8
Factor loading	All variables > 0.5
AVE	All variables > 0.5
Fornell-Larcker Criterion and Cross loading	All indicators were higher than all its cross-loading

Table Error! No text of specified style in document.**.1:** *Summary of analysis*

Table 4.1 shows the summarised analysis. Results for Cronbach's Alpha reading are more than 0.80 for all variables which indicates the variables are very reliable. The factor loadings for all the items surpassed the suggested value of 0.5 and met the study requirements. AVE values are higher than 0.50. It implies convergent validity of the conceptual model construct is satisfied. The cross-loading criterion meets the requirements since the indicator's outer loadings on a construct were higher than all its cross-loadings with other constructs.

4.1 Hypotheses Testing

The structural model assessment found that PE, EE, SI, FR, and PSYR are significantly predicting INT. Hence, H1, H2, H3, H5 and H7 are accepted. However; H4, H6, H8 and H9 are rejected.

Hypo	Relationship	Coefficients (β)	t-value	p-value	Decision
H1	Performance Expectancy → Behavioral Intention	0.203	3.412	0.000	Supported
H2	Effort Expectancy → Behavioral Intention	0.142	2.492	0.006	Supported
H3	Social Influence → Behavioral Intention	0.430	8.433	0.000	Supported
H5	Performance Risk → Behavioral Intention	0.011	0.193	0.423	Not supported
H5	Financial Risk → Behavioral Intention	-0.090	1.732	0.042	Supported
H6	Time Risk → Behavioral Intention	0.027	0.421	0.337	Not supported
H7	Psychological Risk → Behavioral Intention	-0.119	1.942	0.026	Supported
H8	Social Risk → Behavioral Intention	0.022	0.309	0.379	Not supported
H9	Privacy Risk → Behavioral Intention	0.028	0.523	0.300	Not supported

Table Error! No text of specified style in document.**.2:** *Structural path analysis result*

4.2 Coefficient of Determination: R^2 Value

Table **Error! No text of specified style in document.**.3 represents the results of R^2 from the structural model and demonstrates that all R^2 values are sufficiently high to ensure an adequate degree of explanatory power for the conceptual model.

exogenous construct	endogenous construct	R^2	Cohen (1988b)	Chin (1998)	Hair et al., (2013)
EE,FR,INT,PE,PIR,PR,PSYR,SI,SR,TR	INT	0.53	Substantial	Moderate	Moderate

Key: OPT: optimism, INN: innovativeness, INS: insecurity, DIS: discomfort, INF: IT infrastructure, SE: IT self-efficacy, RES: e-resource, SUP: university support, PEOU: perceived ease of use, PU: perceived usefulness, INT: intention to use e-learning

Table Error! No text of specified style in document.**.3** *Coefficient of determination result R^2*

4.3 Effect Size F²

The findings of f² illustrated in Table **Error! No text of specified style in document.**.4 sufficiently explained the effects based on Cohen (1998) recommended f² which is 0.35 (large effects), 0.15 (medium effects), and 0.02 (small effects).

Exogenous construct	Endogenous Construct INT
EE	0.015
FR	0.007
PE	0.035
PIR	0.001
PSYR	0.000
SI	0.011
SR	0.181
TR	0.001

Table Error! No text of specified style in document.**.4:** *Effect size f²*

5. Discussion and Conclusion

To respond to the research questions is to disclose the important issues that can be extracted from the effects of the hypothesized model's estimation. The key contributions of this study are identified by these results. The findings are based on a validated model of measurement that is then evaluated via Confirmatory Factor Analysis (CFA). The evaluation of the study hypotheses is focused on the hypothesized model's estimate. A description of the results of this study in relation to its goals, research questions and the hypotheses produced, is given in Table **Error! No text of specified style in document.**.1. Next, clear and thorough discussions are illustrated, consistent with theoretical insights and previous analytical works and studies, on each of the findings.

No.	Research Objectives	Research Questions	Hypo	Relationship	Decision
1	To identify the factors influencing the users' intention to accept cryptocurrency	What are the factors that influence the users' intention to accept cryptocurrency ?	**H1**	Performance expectancy will have a positive effect on behavioral intention	Supported
			H2	Effort expectancy will have a positive effect on behavioral intention	Supported
			H3	Social influence will have a positive effect on behavioral intention	Supported

2	To design an acceptance model for the intention to use cryptocurrency	How to design an acceptance model for the intention to use cryptocurrency ?	**H5**	Performance risk has a negative effect on behavioral intention	Not supported
			H5	Financial risk has a negative effect on behavioral intention	Supported
			H6	Time risk has a negative effect on behavioral intention	Not supported
3	To validate the proposed acceptance model for the intention to use cryptocurrency	How to validate the proposed acceptance model for the intention to use cryptocurrency ?	**H7**	Psychological risk has a negative effect on behavioral intention	Supported
			H8	Social risk has a negative effect on behavioral intention	Not supported
			H9	Privacy risk has a negative effect on behavioral intention	Not supported

Table Error! No text of specified style in document.**.2:** *Summary of Specific Objectives, Research Questions, Hypotheses, and Results*

5.1 Implications

One of the objectives of the present research is to validate and test the proposed hypothesized model. The prediction and explanation of the behavioral intentions of the non-users of cryptocurrency within the context of the hypothesized model are supported empirically. Several contributions are summarized in this section that has subsequently emerged to the hypotheses testing, and then examining their implications for the three theories, namely: 1) Unified Theory of Acceptance and Use of Technology (UTAUT), 2) the perceived risk theory. This theory is the theoretical integration for the present study while UTAUT is the underpinning theory. To evaluate a theory, there are two criteria to do that, which are: 1) falsifiability and 2) utility. Hypotheses testing has established the first criteria (falsifiability), while the second part, which is utility, refers to the usefulness of the conceptual model from the practitioners' perspective. Essentially, the results and findings revealed in the present study shed new light on the existing literature on technology acceptance and usage and marketing, and provide industry practitioners with an understanding of the significance of performance expectancy, effort expectancy, social influence, financial risk and psychological risk toward behavioral intention to use cryptocurrency.

5.2 Limitations and future research

This current study enriches the body of knowledge on perceived risk, UTAUT (performance expectancy, effort expectancy, social influence and behavioral intentions to use cryptocurrency services. Notwithstanding the fact that cryptocurrency in Malaysia has made a revolution in

the way that Malaysian clients handle their banking transactions, future research can explore other areas from different perspectives, which are market orientation and a more comprehensive assessment of relationship marketing, that can promote the more effective promotion of cryptocurrency itself.

There are different platform of cryptocurrency services, i.e. (BitCoin, Ethereum, etc.), future research may need to focus on a specific platform of cryptocurrency services. Consequently, extending the study conclusion to a specific type of service must be considered a partial test of the working hypotheses. Moreover, researchers in the future may wish to repeat the research with other electronic service applications to test more, if the significant factors are the same, as well as to extend the testing of the scale in other countries and cultures. Therefore, the generalizability of the findings reported in this study can be addressed.

Consequently, qualitative research can be done so that in-depth investigation and therefore knowledge can be learned for the purpose of understanding what it really takes to raise their commitment towards using cryptocurrency services. Although the design of longitudinal research is relatively costly and consumes much time, it might provide better and stronger inferences for causality and enhance understanding of the dynamics of characteristics of innovation and cryptocurrency clients' responses.

Additional research may also need to examine the moderating role of numerous other variables (e.g. demographic variables or trust, cultural dimensions) between the performance expectancy and intention to use cryptocurrency relationship to enhance the power of prediction of the study model. It is suggested that further work in the area should be considered to address this complexity.

To finish, it is recommended that future researches go one step further by integrating actual behavior (Usage) into the proposed model and not only behavioral intention. Although generally it is considered expensive, consumes much time, and is a problem logistically, measuring actual behavior will enhance the validity of the studies based on the behavioral intention. Even though that behavioral intention has proven as a good predictor of actual behavior in many fields of behavioral sciences, research examining the power of prediction of intention on actual behavior is still limited.

5.3 Conclusion

The main objective of this study is to determine factors influencing the use of cryptocurrency among users in Malaysia. Regardless of various limitations of the study, the findings have been encouraging, as it has managed to shed some light on new variables of behavioral intention.

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