Investigating Intention to Use Central Bank Digital Currency in Indonesia

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Abstract

Central Bank Digital Currency (CBDC) is a digital currency issued by a government-controlled central bank of a particular country. Bank Indonesia as the central bank in Indonesia has been trying to develop a CBDC known as digital rupiah. Digital rupiah is expected to complement and perform same function as the fiat money in Indonesia. Research is needed to identify people's views on the use of CBDCs. This study seeks to understand the factors that influence the intention to use CBDC by adapting Technology Acceptance Model. Data were collected through questionnaires from 565 valid respondents. Partial Least Square-Structural Equation Modeling (PLS-SEM) was used to evaluate the proposed model. This study verifies that perceived usefulness, perceived ease of use, hard trust, and soft trust can influence intention to use CBDC in Indonesia, while personal innovativeness is known to influence perceived usefulness and perceived ease of use.

Keywords: CBDC, Digital Rupiah, TAM, Trust, Personal Innovativeness

1.　INTRODUCTION

Central bank digital currency (CBDC) is a type of digital version of fiat money produced by central banks and designed to function as legal tender [1]. CBDC primarily aims to increase the security, resilience, and efficiency of payments, as well as to minimize issuance costs and increase transaction convenience [2]. CBDC is intended to alleviate the market dominance of private payment systems [3]. It is projected to be more stable compared to private digital currencies.

Currently, various central banks all over the world have been considering and developing CBDCs. They will introduce it in the next few years. Bank Indonesia as the central bank in Indonesia has been trying to keep up with the trend by planning the issuance of a CBDC known as digital rupiah. Digital rupiah is predicted to serve as the money of the future in Indonesia to complement and to bear the same function as fiat money.

CBDC is deemed as an important field of study for most central banks globally, especially with the rise of private money and the increasing use of digital payments [4]. However, as a matter of fact, there have been considerable challenges in the implementation of CBDC, particularly related to technological, economic, social, political, environmental, and ethical issues [5]. Central banks have been supporting the use of digital currencies since it is considered as a very important advancement in digital transformation, but it is necessary to do research on CBDC to gain an insight on the public acceptance [6]. Currently, there have only been a handful CBDC-related research, especially in Indonesia. Therefore, this research aims to find out the public acceptance of CBDC in Indonesia by investigating the factors that influence intention to use CBDC. Understanding user views is necessary in the development of CBDC.

Technology Acceptance Model (TAM) is a widely referred theory to assess technology acceptance. Various research on financial technology acceptance adapted TAM to carefully examine the issue [7]–[11]. TAM is a relatively simple method, which thus requires relevant explanatory variables to be added to the model to assess a particular technology [12]. Therefore, this research adapted TAM by adding the construct of trust as a predictor of intention to use CBDC. It is undeniable that perceived usefulness, perceived ease of use, trust are the factors that most significantly influence the use of digital financial transactions [13].

This paper is structured as follows. Section 2 describes the research model, research instruments, sample, and data analysis methods. Section 3 displays the results and discussion, while section 4 is the research conclusion.

2. METHODS

2.1. Research Model

TAM which is an information systems theory places perceived usefulness and perceived ease of use as predictors. Perceived usefulness is defined as the extent to which a person believes that using a particular system will improve his or her job performance [14]. Perceived ease of use is defined as the extent to which a person believes that using a particular system will be easy [14]. Both variables could influence intention to use technology in previous studies [15], [16].

Trust is an important consideration in decision-making whether to use an electronic payment system or not [17]. Trust is the most unstable of all characteristics because it easily changes in judgment [17]. Trust is positively related with the government and the use of e-government, which indicates that the government must try to increase public trust [18]. Previous research stated that trust can influence behavioral intention [19], [20]. In this study, trust was integrated

into the model. It was divided into two, hard trust and soft trust. Hard trust relates to the fundamental functions of money as a unit of account, medium of exchange, and store of value, while soft trust includes trust in the security of the system and the credibility [21].

Personal innovativeness is another crucial element when it comes to highly innovative technologies. Personal innovativeness is a significant determinant of the perception and acceptance of new technology by individuals. Individual who has high personal innovativeness can develop a more positive perception about innovation [22]. Personal innovativeness was known to serve as a potential antecedent for perceived usefulness and perceived ease of use [23], [24]. Personal innovativeness is defined as an individual's desire to experiment with new information technology [25]. Investigating the importance of personal innovativeness in the field of information technology is an important research subject in the field of technology adoption [26]. This research investigated the significance of personal innovativeness on perceived usefulness and perceived ease of use.

Thus, the independent variables used in this study are perceived usefulness, perceived ease of use taken from TAM, and additional hard trust and soft trust. Personal innovativeness was added as an external variable. Based on the literatures, the research model is illustrated in Figure 1 and the study hypothesizes that:

H1. Perceived usefulness can significantly influence intention to use CBDC.
H2. Perceived ease of use can significantly influence intention to use CBDC.
H3. Hard trust can significantly influence intentions to use CDBC.
H4. Soft trust can significantly influence intention to use CBDC.
H5. Personal innovativeness can significantly influence perceived usefulness.
H6. Personal innovativeness can significantly influence perceived ease of ease.
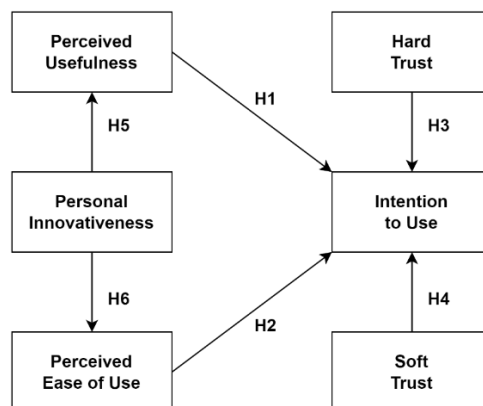

Figure 1. Research Model

2.2. Measurement Instrument

The indicators were arranged based on the constructs in the proposed research model. This research used six constructs with a total of 27 indicators to measure the constructs. The measurement items were adapted from previous studies which were in English. Therefore, it was translated into Indonesian.

Perceived usefulness used five indicators adapted from measurements in TAM, while perceived ease of use has five indicators [14]. Hard trust and soft trust have five indicators for each adapted from previous research [27]. To assess intention to use as the dependent variable in this study, four indicators were adapted from previous research [28]. Personal innovativeness used three indicators adapted from previous study [25].

2.3. Data Collection and Sample

Data were collected by distributing questionnaires online. All questionnaire items used a five-point Likert scale. Before respondents started filling out the questionnaire, they were introduced with an explanation about CBDC. The participants in this study were 565 people. Respondent demographics are presented in Table 1.

Table 1. Demography Respondents

Item	Option	Qty.	Percentage (%)
Sex	Female	398	70
	Male	167	30
Age	<18	22	4
	18–29	439	77
	30–39	80	14
	40–49	22	4
	50–59	2	1
Education	Lower than High School	17	3
	High School	293	52
	Diploma	39	7
	Bachelor	202	36
	Master	14	2
Area	Urban	367	65
	Suburban	134	24
	Rural	64	11

2.4. Data Analysis

This study used a quantitative approach. The Partial Least Square-Structural Equation Modeling (PLS-SEM) method was used to test the hypothesis. The

collected data were analyzed using SmartPLS 4 software [29]. Data were analyzed in two stages. The first was to evaluate the measurement model, followed by the evaluation on the structural model. The reliability of the instrument was assessed by looking at the results of the loading and composite reliability values, which ideally are above 0.7 [30]. The convergent validity of the instrument was assessed by measuring the average variance extracted (AVE) with a minimum value of 0,5 [30]. Discriminant validity was assessed by looking at the heterotrait-monotrait ratio (HTMT) which should be lower than 0.85 for conceptually different constructs and below 0.90 for conceptually similar constructs [31]. The explanatory power of the model was determined by assessing the R^2 value. The hypothesis testing was determined based on the p-value.

3. RESULTS AND DISCUSSION

3.1. Measurement Model Evaluation

The evaluation results revealed that the indicator loading, composite reliability, AVE, and HTMT values meet the criteria. All constructs showed a value above 0.7, and thus they were considered reliable. The AVE value of all constructs had a value above 0.5 according to the criteria so that all constructs were valid. The indicator loading value should be above 0.7, but values between 0.4 and 0.6 were still maintained as long as the construct validity and reliability criteria were met, which was not a problem [32]. All loading values on the indicators were acceptable. Regarding the HTMT value, all relationships between constructs had values lower than 0.85 except for hard trust and soft trust. However, the bootstrap results were below 1. It could be accepted. The indicator loading, composite reliability, and AVE values are presented in Table 2, while the HTMT values can be seen in Table 3.

Table 2. Indicator loading, composite reliability, AVE

Constructs	Items	Loadings	Composite reliability	AVE
Perceived Usefulness (PU)	PU1	0.779	0.869	0.570
	PU2	0.723		
	PU3	0.786		
	PU4	0.774		
	PU5	0.709		
Perceived Ease of Use (PEOU)	PEOU1	0.757	0.872	0.576
	PEOU2	0.736		
	PEOU3	0.763		
	PEOU4	0.787		
	PEOU5	0.751		

Constructs	Items	Loadings	Composite reliability	AVE
Personal Innovativeness (PI)	PI1	0.832	0.874	0.698
	PI2	0.805		
	PI3	0.867		
Hard Trust (HT)	HT1	0.661	0.844	0.520
	HT 2	0.723		
	HT 3	0.744		
	HT 4	0.730		
	HT 5	0.742		
Soft Trust (ST)	ST1	0.672	0.840	0.514
	ST2	0.793		
	ST3	0.762		
	ST4	0.718		
	ST5	0.628		
Intention to Use (ITU)	ITU1	0.794	0.873	0.633
	ITU2	0.781		
	ITU3	0.804		
	ITU4	0.804		

Table 3. HTMT value

	HT	**ITU**	**PEOU**	**PI**	**PU**	**ST**
HT						
ITU	0.820					
PEOU	0.654	0.794				
PI	0.562	0.628	0.597			
PU	0.691	0.811	0.809	0.445		
ST	0.952	0.838	0.704	0.549	0.736	

3.2. Structural Model Evaluation

This research denoted that the research model explained 61.3 percent of the variance in intention to use, 13 percent of the variance in perceived usefulness, and 23.1 percent of the variance in perceived ease of use. Analysis revealed that all proposed hypotheses were acceptable. Perceived usefulness ($\beta = 0.242$; $p < 0.001$), perceived ease of use ($\beta = 0.242$; $p < 0.001$), hard trust ($\beta = 0.239$; $p < 0.001$), and soft trust ($\beta = 0.212$; $p < 0.001$) were found to have a significant effect on intention to use CBDC in Indonesia. Personal innovativeness has also been found to have

a significant effect on perceived ease of use ($\beta = 0.481$; $p < 0.001$) and perceived usefulness ($\beta = 0.360$; $p < 0.001$) positively. The results of the structural model analysis are displayed in Figure 2 and Table 4.
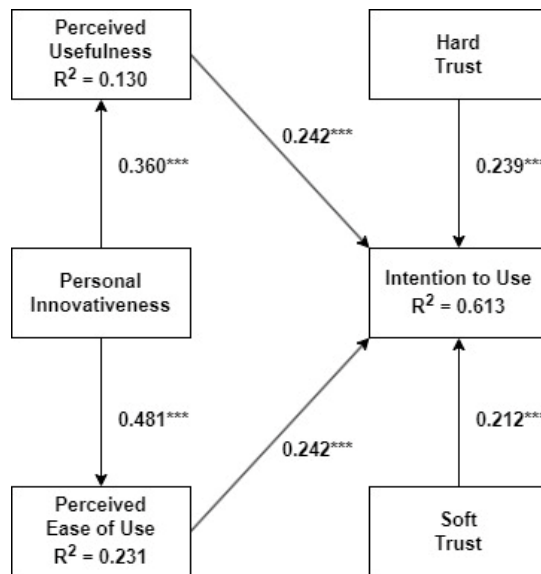

Figure 2. Results of structural model analysis

Table 4. Summary of the results

Hypotheses	Path	Path Coefficient	*p*-value	Conclusions
H1	PU → ITU	0.242	0.000	Accepted
H2	PEOU → ITU	0.242	0.000	Accepted
H3	HT → ITU	0.239	0.000	Accepted
H4	ST → ITU	0.212	0.000	Accepted
H5	PI → PU	0.360	0.000	Accepted
H6	PI → PEOU	0.481	0.000	Accepted

3.3. Discussion

Based on the results, this study confirms that perceived usefulness and perceived ease of use, as the two constructs of TAM, can significantly influence intention to use CBDC. These findings are in line with previous studies concluding that perceived usefulness and perceived ease of use could influence the use of financial technology [33], [34]. The usefulness and convenience of CBDC will make people interested in using it.

The research results stated that trust was proven to be an important part in the acceptance of a new technology, for both hard trust and soft trust. This study is in line with the CBDC study in Germany, which stated that hard trust and soft trust were the factors influencing behavioral intention [27]. Building trust is necessary even before the product is tested [35]. The greater an individual's trust in CBDC, the more interested they will be in using CBDC. Trust, which is closely related to security, credibility, image, liquidity, fungibility, and stability, is the cornerstone of the successful implementation of risk-prone CBDCs. Institutions should work to create trust in CBDCs so that their efforts to offer flexible and easy-to-understand digital currencies will encourage their acceptance [36].

This research also proves that personal innovativeness positively influences perceived ease of use and perceived usefulness. This is contrary to previous research implying that innovativeness did not affect the usability and ease of e-money adoption [37]. More innovative individuals tend to find new technologies easier to use and more valuable in meeting their needs.

4. CONCLUSION

The findings can provide practical and theoretical contributions to the acceptance of CBDCs. This study contributes to information systems literature by examining the factors that influence intention to use CBDC. It helps identifying critical aspects to consider while designing CBDC. This research exposed that perceived usefulness, perceived ease of use, and trust play an important role in building relationships between users and publishing authorities. Personal innovativeness was also shown to influence perceived usefulness and perceived ease of use CBDC is yet to be released in Indonesia. It is still not certain how CBDC will be implemented, even though Bank Indonesia has released the white paper. Thus, this research has many limitations. Future research is expected to further explore this issue, including by testing other possible factors or by putting more emphasis on public acceptance in less accessible areas.

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