

FACTORS AFFECTING THE WILLINGNESS TO
ADOPT CENTRAL BANK DIGITAL CURRENCY
(CBDC) AMONG UNDERGRADUATE STUDENTS
IN UTAR

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BY

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

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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.
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LIST OF ABBREVIATIONS

BIS	Bank for International Settlements
BNM	Bank Negara Malaysia
CBDC	Central Bank Digital Currency
FAS	Faculty of Arts and Social Science
FBF	Faculty of Business and Finance
FEGT	Faculty of Engineering and Green Technology
FICT	Faculty of Information and Communications Technology
FSc	Faculty of Science
FK	Financial Knowledge
ICS	Institute of Chinese Studies
IMF	International Monetary Fund
NIRP	Negative interest rate policy
OI	Openness to Innovation
PF	Privacy Factor
RF	Regulatory Factor
SF	Security Factor
UTAR	Universiti Tunku Abdul Rahman
UTAUT	Unified Theory of Acceptance and Use of Technology
WA	Willingness to Adopt CBDC

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PREFACE

This study is the final year project of undergraduate course, Bachelor of Economics (Hons) Financial Economics in UTAR. The topic is “Factors Affecting The Adoption of Central Bank Digital Currency (CBDC) Among Undergraduate Students in UTAR”. Five independent variables are being examined to determine their relationship with willingness to adopt CBDC.

CBDC is an advanced technology and is still not familiar to the public. However, it is believed that CBDC has many advantages that can further enhance the living conditions of humans. Therefore, the government and central bank need to assess the viability of CBDC adoption. Factors affecting the adoption of CBDC can be evaluated to assist in the adoption strategy in the future.

Hence, this study examines the relationship of five independent variables which are privacy factor, financial knowledge, openness to innovation, regulatory factor, and security factor with the dependent variable of willingness to adopt CBDC. This research is expected to offer some insights to relevant parties who can decide on the adoption of CBDC.

ABSTRACT

Due to the rapid economic and technological development, digital currency is gradually integrated into daily routine as a medium of exchange instead of physical cash. However, most digital currencies are decentralized but not managed by a centralized authority, leading to difficulty in controlling. A new type of digital currency known as CBDC which is fully controlled by a country's central bank can tackle this issue. Hence, studies on willingness to adopt CBDC are being conducted by researchers. However, limited research on the opinion of undergraduate students is done. Hence, this study examines factors affecting willingness to adopt CBDC among undergraduate students in UTAR. The five independent variables examined are privacy factors, financial knowledge, openness to innovation, regulatory factors, and security factors. We collected responses from 393 undergraduate students in UTAR Kampar using surveys. Reliability test, multicollinearity test, and normality test are done before analyzing the relationship. Then, multiple linear regression analysis is used as inferential analysis to examine the relationship. All the tests run through SPSS 26.0. Our findings are all five independent variables have a significant and positive relationship with willingness to adopt CBDC. Therefore, government and agencies related should emphasize these factors when considering adopting CBDC.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

The current chapter first discusses the general background of our study. Then, problem statement mentioned the problem that we desire to address through our studies. After that research objectives and research questions are listed in two different sections. The benefit of our study is explained by elaborating how significant is this study for relevant parties. Next, the layout section of this chapter mentions the overall summary of each chapter of this study. Lastly, a conclusion is made to summarize the important points of this study in this chapter.

1.1 Background of Research

Physical cash and coins have become the main medium of exchange for all individuals since the traditional financial system was built. However, due to the rapid economic and technological development, the terms of digital currency have been widely publicized to society (Chu et al., 2022). According to Mzoughi et al. (2022), type of digital currency has been formally separated into two types which is the decentralized digital currency guaranteed by cryptography which most individuals call cryptocurrencies; and the other type is centralized digital currency guaranteed by financial regulators which is the central bank digital currencies (CBDC). Comparing the cryptocurrencies and CBDC, CBDC tends to have higher credibility in society. This is because CBDC as a digital currency was backed by an authorized organization which is a central bank of a country. Besides, CBDC acts as an effective monetary policy tool that can help the country achieve economic growth. For example, research conducted by Yang & Zhou (2022) shows that the

nature of digital currency makes the China CBDC, e-CNY able to control the country's money supply accurately. By having accurate control of the money supply, the loanable funds to the public can be maximized and bring efficiency to the whole economy. This is the reason why the issue of the adoption of central bank digital currencies (CBDC) has been given a lot of attention by economists, researchers, and politicians.

However, there are still some arguments about the necessity of adopting CBDC in every country in the world. According to Ngo et al. (2023), the adoption of CBDC in a country must take into account the value it brings and the cost of development. If the benefit of the adoption of CBDC to society was much higher than the cost of developing it, then the country was considered to have the ability and requirements to adopt CBDC in the future. Besides the cost and benefit analysis, the adoption of CBDC should also consider the public sentiment and government sentiment in a country. Public sentiment mentioned whether the citizens of a country were or weren't allowed to use digital currency in their daily transactions; while government sentiment mentioned the ability and willingness of the government to have long-term development on issuing CBDC to the public. During the process of developing CBDC, there was always a trade-off that the government required to put out some resources either financial resources or human manpower from existing infrastructure development. This trade-off can reduce the benefits of citizens in the short-term as the government reduces resource allocation on public welfare leading to a decrease in the willingness to develop CBDC in the country.

From the requirement above, we get to know how difficult for a country to adopt CBDC for their citizen in their daily life. There are just a few countries in the world that have fully adopted CBDC for their daily transaction. According to Allen et al. (2022), China was taking the first step advantage of widely using the central bank digital currency followed by Sweden. While other Western countries like Europe, Switzerland, and Denmark were still in the development stage. From a Western country perspective, Sweden experienced a long history of the adoption of CBDC

to the country. According to Ozturkcan et al. (2019), country Sweden started to announce their CBDC, e-krona in the year 2018. The adoption of e-krona in Sweden can provide value to the country by letting their citizens able to access the money in the central bank 24/7 online with an enhanced payment system. However, during the development of e-krona, the cost of it also cannot be ignored. According to Virtanen (2021), due to the widely publicized e-krona, the demand for cash in country Sweden has dropped significantly. This forces the commercial bank in Sweden to hire more people who understand the operation of digital currency and this action leads to an increase in the operational risk and liquidity risk to the commercial bank then has a probability of facing bankruptcy in the future. Fortunately, Sweden's government and central bank were able to manage the significant event by setting restrictions on access and applying caps on e-krona to increase the demand for physical cash. The case study above shows the importance of government sentiment on the adoption of CBDC in a country.

While for the Asia country, China has been leading the whole world in the adoption of CBDC for their daily purpose. Different from other countries, China was implementing a two-tier system on the adoption of CBDC. This means that China does not appoint only one authorized institution which is China's central Bank, but also other institutions including six state-owned banks, three telecommunication operators, and two commercial banks. The reason why China was implementing such a policy was to increase public sentiments on the adoption of CBDC. According to the concept, a centralized digital currency that is authorized by only one institution increases the security risk of an individual as the central bank cannot handle and secure large data of China citizens. So, when the country has set multiple authorized institutions to secure the CBDC, the country's citizens will tend to use the central bank's digital currency for their daily transactions (Wang, 2023).

Based on the two case studies above, it is shown the importance of public sentiment and government sentiment on the adoption of CBDC. Based on previous studies, there are a lot of countries in the world that already implement central bank digital

currency (CBDC) in their monetary system and transaction system which include United States, United Kingdom, China, Brazil, Sweden etc. (Normi et al., 2022). Malaysia as a country that presents different compared with the countries mentioned above from an economic system perspective attracts researchers to investigate the willingness of adoption of CBDC in such country as Malaysia was also one of the Southeast Asian countries that implement Islamic finance in its economy. From the development perspective, according to Prayudya and Al-Ayubi (2023), Islamic finance practice in a country would highly affect the design of CBDC as it should always follow the Islamic principle. If the system design of CBDC is developed based on the technical immediacy principle of cryptocurrency, then its adoption will violate the ushul fiqh principle and Ibnu Majah number 2340 principle as both principles lead the design of CBDC should be 100% anti-interest rate, anti-speculation (profit-sharing mechanism), fully transparency and fully fairness to its users which highly violates the function of a currency. From the user's perspective, the security of using CBDC is to be confirmed as an equal right and full transparency from Islamic finance principles to be developed in its regulatory framework (Omar, 2022). It is concluded that existing of Islamic finance principles in CBDC highly affects the nature of CBDC and then leads to changes in willingness to adopt CBDC for an individual.

For the cases of Malaysia, Bank Negara Malaysia (BNM) does not have a detailed plan for the adoption of CBDC. According to the annual report prepared by BNM (2021), the country doesn't need to implement CBDC in a short time since the conventional financial system of Malaysia still meets the needs of individuals and businesses. Besides, it is measured that the risk of issuing CBDC to the public was far higher than the benefit. The report of Financial Sector Blueprint 2022-2026 provided by BNM (2022), it is highlighted that regulatory risk and security risk constantly act as the main determinants that slow down the adoption of CBDC. Currently, Malaysian citizens still feel more comfortable using physical cash as their medium of exchange. BNM claimed that it is necessary to promote the financial inclusion of Malaysian citizens, especially Malaysian students to meet the requirements of adopting CBDC in the future.

Even though BNM has stated that CBDC is not essential to exist in the current economy, the rise of digital currency has become a trend in society. According to the statistics, there are about 90 central banks in the world that interest to engaged in the development of central bank digital currency since 2016 (Pinyonatthagarn, 2017). Maulana et al. (2019) stated that Bank Indonesia promotes the use of non-cash payment and mentioned electronic payment by digital currency was the best option for society compared with others like card payment, cheques, etc. In 2017, Sweden was in the process of replacing all of its physical cash notes with its central bank digital currency, e-krona. In December 2020, statistical results showed that 235.2256 billion transactions with a value of RMB2711.81 trillion were paid in electronic form in China (Sun, 2021). In the context of Malaysia, electronic payment increased significantly from the year 2019 to the year 2023. Based on BNM (n.d.) data, electronic transaction examples like JomPay have increased from 41.9 volume to 84.7 volume. Besides, a statistical result conducted by Ishak (2020), 56% of digital payments in Malaysia were using e-money to complete their transaction, followed by online banking at 23% and credit cards at 13%. The result indicates that the trend of the rise in digital currencies has not just happened in Western countries or highly developed countries, but also in Malaysia. Therefore, early research about digital currencies will be a great help to the country's future development of CBDC.

It is believed that university students play important roles in the willingness to adopt CBDC. According to Amarta & Latifah (2023), students have the highest influence power on the willingness to adopt CBDC as they are more willing and open and have more knowledge to accept new technology that is publicized to society. They are young and can more easily adapt to the change in technology as they study various courses that are up to date with the booming environment (Vetrichelvi & Priya, 2022). In addition, CBDC is a technology-based currency that is associated with Internet usage, which is commonly used by Generation Z who were born between 1996 and 2010 (Sagheer et al., 2022). Generation Z year 2005 aged

between 18 to 26 in 2023 are mainly undergraduate students who are open-minded and have high technology acceptance. Hence, they are most likely to have a higher willingness to adopt CBDC. However, there is a problem which there are limited studies on the willingness to utilize CBDC among undergraduate students in the country of Malaysia. Therefore, the research conducted needs to study what are the actual factors that affect the willingness to adopt CBDC.

Universiti Tunku Abdul Rahman (UTAR) students are selected as targets because UTAR has various courses offered that are related to finance. CBDC is part of the finance subject, so students in UTAR do have certain knowledge about CBDC. Besides, UTAR combined business and finance into a faculty which FBF, the second most courses offered by the faculty in UTAR, with 13 courses in total (UTAR, 2024). Hence, this showed that many experts in related fields are teaching in UTAR, so students are more likely to understand CBDC with a certain degree.

Among the three types of students available in UTAR including foundation, undergraduate, and postgraduate students (UTAR, 2024). Undergraduate students are selected as reference population. This is because CBDC is an advanced knowledge that will be learned at the undergraduate level. Foundation students are still learning the fundamental knowledge, so they lack basic knowledge about CBDC. Meanwhile, the number of postgraduate students in UTAR is lesser than undergraduate students. A larger population can increase the sample size, so the result is more accurate; hence, undergraduate students are opted.

Lastly, UTAR has two campuses which are in Kampar, Perak, and Kajang, Selangor. Campus in Kampar is selected as the sampling location because UTAR does not offer the courses on two campuses at the same time to gather the students of the same course in a campus to achieve efficiency in resources. The 13 courses related to finance under FBF are all available in UTAR Kampar only (UTAR,

2024). Hence, the students in UTAR Kampar are more familiar with the term CBDC and can give a more appropriate opinion regarding CBDC to make the result meaningful.

1.2 Research Problem

From a worldwide perspective, the existence of CBDC is essential for countries as a solution to tackle the issues that are currently facing in society and economy. International Monetary Fund (IMF, 2023) has received some requests from 40 countries to assist in the development of CBDC. It shows the importance of CBDC has getting attention from the world. First of all, CBDC can solve the social and crime problem (Xia et al., 2023). According to Yizhen & Amer (2022), the rise of digital assets has raised illegal transactions as well. This is because digital assets are not regulated and decentralized which makes the flow of assets hard to be traced. For example, cryptocurrency like Bitcoin is one of the famous digital monies. Due to its unregulated characteristics, Bitcoin has become one of the major mediums of exchange in illegal transactions and money laundering the suspected criminals which had increased by 40% in 2015 (Europol, 2015). In contrast, the central bank can track the flow of CBDC to detect the economic activities performed by the parties involved. This can decrease the chance of doing illegal transactions in the society. For example, after conducting the pilot test on CBDC usage in 2020, the informal economic activity in China has declined from 23.5% of GDP in 2019 to 12.7% in 2023 (World Economics, 2023).

Apart from that, the trading instruments used by people worldwide has their weaknesses. Both conventional money either physical or e-money and digital assets such as cryptocurrency and stablecoins do not have the strength as CBDC. First, an instrument needs to meet three requirements to become money, which is able to provide the function of value storing, exchange transaction, and unit of account. Starting with the famous digital currency nowadays, cryptocurrency that is issued

in the decentralized network is not widely accepted. This is because it does not fulfill the fundamental requirement, which is not backed up by the central bank, is too volatile, and is not widely used for pricing (Alonso et al., 2020). Although there are stablecoins issued by private companies that are relatively stable in value because it is backed up by assets, have the potential to be used for payment, and become units of account in terms of fiat currency, they still have certain risks as it is issued by private authority instead of the sovereign body. In contrast, CBDC which is issued by the central bank is risk-free as it is similar to fiat currency (BNM, 2021). In brief, the current digital currency is not suitable to become money compared to CBDC.

Meanwhile, traditional currencies like fiat currency or e-money such as Touch 'n Go also have disadvantages compared to CBDC in terms of monetary policy. The three instruments are the same in the three characteristics of money (BNM, 2021). However, traditional currencies are less effective in terms of monetary policy. This is because the effects of monetary policy might not be fully transmitted due to the intermediation (BNM, 2017). In addition, Xin and Jiang (2023) mentioned that the existence of CBDC can calculate the aggregate demand of the money and actual money supply more precisely. This is because CBDC is centralized, and the data are wholly managed by the financial regulator which implements monetary policy. Besides, the nature of CBDC allows the central bank to implement unconventional monetary policies such as the negative interest rates policy (NIRP) to the public more effectively. This is because the traditional currencies have zero lower bound constraints which had put a constraint on the policy's effectiveness. In contrast, an unconventional monetary policy with a NIRP by CBDC is more powerful in smoothing the macroeconomic volatility due to uncertainty shock and recovering the economy (Xin & Jiang, 2023). For example, Japan implemented a NIRP and successfully accelerated the economy by increasing investment, halting the appreciation trend, and stopping the falling stock price in 2016 (Honda & Inoue, 2019).

In the context of Malaysia, which is not yet adopting CBDC, the financial crime rate is increasing gradually. It is estimated that financial crime which includes cash theft and bank robbery have increased by 12,092 cases in July 2022 (Aufa, 2023). Another financial crime, money laundering is also a serious issue in Malaysia. The 10th Prime Minister of Malaysia, Anwar Ibrahim claimed that Malaysia is among the top in misusing funds in the world as political leaders are involved in large amounts of money laundering (Hana & Qistina, 2023). Anwar added that the high effort needed to be spent on the investigation because the bank could not detect some of the fund sources. This shows that the current legal tender used has weaknesses. Furthermore, due to the nature of cash, which is untraceable, the underground economy in Malaysia continuously increases and has been estimated at 25.3% of GDP in 2023. This is ranked as “B” out of five categories which is the first five alphabets. Although it is already at an above-average level, it is still considered a problem because it brings negative effects (World Economics, 2023).

Consequently, Malaysia’s economy becomes less efficient as financial crime decreases the investors’ confidence and the underground economy causes less GDP. The issues of increasing financial crime, larger underground economics issues, and ineffective monetary policy can be tackled to an extent if CBDC is implemented. However, Deputy Finance Minister II Yamani Hafez announced that BNM does not plan to issue CBDC in a short period (*Bernama*, 2021). BNM worried that the implementation of CBDC will bring along some negative impacts after evaluating the risk such as cyber threats, lack of scalability, and price volatility. In addition, the progress of Malaysia is far behind compared with its neighboring countries. For example, China is in the third phase, the pilot stage of using CBDC; Thailand and Singapore are second phase, the proof-of-concept stage; yet, Malaysia still hasn’t stepped into the first stage of research (Normi et al., 2022). Hence, it is important to have more research about factors affecting the willingness to adopt CBDC among Malaysian citizens to boost the CBDC adoption progress in the future as it can solve a lot of economic problems.

For the public, the privacy factor is also an issue for not having CBDC. In this advanced era, efficiency is the major consideration. Hence, compared with cash, the new generation preferred online payment which includes e-money and digital currency that are save time and money. However, these service providers either private companies or commercial banks and others do have the risk of privacy leaking for their interest. Adversely, CBDC issued by the central bank, a non-commercial party that acts in the best interest of the country does not need to utilize private transaction data and can firmly ensure protection of data as a public institution (Xia et al., 2023).

Besides privacy factors, financial knowledge is also a concern as there is a low financial literacy in society (Amarta & Latifah, 2023). Financial knowledge is important to monitor assets to avoid financial problems. One who has high financial literacy can avoid mistakes and make the correct decision to increase assets. It is believed that financial knowledge is important to achieve economic growth. However, the economy is slow down when low literacy exists among people. Thus, the implementation of CBDC can solve this issue. CBDC is part of finance under the payment system. If CBDC is implemented, people will start to learn this new thing and join various talks to learn the theory.

Next, openness to innovation is one of the obstacles to efficiency. Rapid changes are happening in the world to become more efficient. People need to be open-minded to new things so they can improve themselves. The payment system kept evolving from barter systems in ancient times to commodity money such as gold, and fiat currency which are cash and coins, until electronic money such as online payment had more benefits than before such as faster, safer, and more convenient. CBDC is another evolution that can further boost efficiency. If people are not willing to make changes, they can no longer achieve better benefits.

Apart from that, the regulatory factor measures the management and monitoring of money. The implementation of CBDC that substitutes all other types of currency

can make consistent management which decreases the cost of managing. This allows the authority to focus on other important aspects such as security factors. In other words, the implementation of CBDC can avoid the high management cost.

Furthermore, the security factor is the ability to protect CBDC. CBDC is the safest type of money (BIS, 2021) because it is straightly monitored by the BNM which can access all the transactions for investigation if any cases happen. Besides, the central bank is protected from court-ordered bankruptcy. In addition, it is backed by indirectly by tax (BIS, 2023). In contrast, other private companies that issue digital currency might face the risk of bankruptcy. This will lead to a loss of money for the public.

Next, this study targets university students as students lose the opportunity to access financial inclusion. This is because CBDC can help students to obtain financial inclusion. For example, Hungary ran a CBDC pilot project named “Digital Student Safe” in September 2020 which aims to support the financial inclusion of students that includes accessibility to financial services (Faykiss et al., 2022). CBDC allows the students to have practical chances in real-world economic activity which is beneficial for them in terms of experiences after they graduate. The studies presented a result that an increase in financial inclusion can enhance economic growth. Hence, if there is no CBDC, students’ chance to access financial inclusion decreases, the economy grows slower.

For the research gap, there is a population gap. The current research on the adoption of CBDC focuses mostly on the general population like what have been done by Gupta et al. (2023a), Gupta et al. (2023b), Wu et al. (2022), and Kim et al. (2022). While these studies provide useful insights into the attitudes and behaviors of the general population, study on investigate the university degree students was limited. This generation is critical for determining the future adoption of CBDC since they are digital natives who are more comfortable with emerging financial technologies. Furthermore, their economic behaviors, priorities, and risk perceptions may be very

different from those of other age groups. However, little emphasis has been paid to identifying the exact elements that influence their acceptance or rejection of CBDC. Investigating this demographic's attitudes and concerns could give a better understanding of CBDC adoption and assist to develop specific initiatives for increasing engagement and adoption among younger demographics. As a result, future research should close this gap by concentrating on undergraduate students as a unique group to better understand the numerous factors influencing their readiness to embrace CBDC.

1.3 Research Objectives

1.3.1 General Objectives

This study has been conducted in order to provide the aim and objectives to the society which is to investigate and identify the factor affecting willingness to adopt CBDC among undergraduate students in UTAR.

1.3.2 Specific Objectives

To fulfill the general objectives, five specific objectives need to be constructed.

1. To examine whether the UTAR's undergraduate students have a significant association between the privacy factor and their willingness to adopt CBDC.

2. To examine whether the UTAR's undergraduate students have a significant association between financial knowledge and their willingness to adopt CBDC.
3. To examine whether the UTAR's undergraduate students have a significant association between the openness to innovation and their willingness to adopt CBDC.
4. To examine whether the UTAR's undergraduate students have a significant association between the regulatory factor and their willingness to adopt CBDC.
5. To examine whether the UTAR's undergraduate students have a significant association between the security factor and their willingness to adopt CBDC.

1.4 Research Questions

1. Do UTAR's undergraduate students have a significant association between the privacy factor and their willingness to adopt CBDC?
2. Do UTAR's undergraduate students have a significant association between financial knowledge and their willingness to adopt CBDC?
3. Do UTAR's undergraduate students have a significant association between the openness to innovation and their willingness to adopt CBDC?
4. Do UTAR's undergraduate students have a significant association between the regulatory factor and their willingness to adopt CBDC?
5. Do UTAR's undergraduate students have a significant association between the security factor and their willingness to adopt CBDC?

1.5 Hypotheses Constructed

Total number of five hypotheses are developed in this study and will be addressed in this section:

1. It is expected that privacy factor is going to influence the willingness to adopt CBDC among UTAR's undergraduate students.
2. It is expected that financial knowledge is going to influence the willingness to adopt CBDC among UTAR's undergraduate students.
3. It is expected that openness to innovation is going to influence the willingness to adopt CBDC among UTAR's undergraduate students.
4. It is expected that regulatory factors are going to influence the willingness to adopt CBDC among UTAR's undergraduate students.
5. It is expected that security factors are going to influence the willingness to adopt CBDC among UTAR's undergraduate students.

1.6 Research Significance

First and foremost, this research may enrich the literature regarding willingness to adopt CBDC because CBDC is a new technology that is not yet mature. Currently, there are limited studies because CBDC is not widely adopted in the world. The researchers can utilize this research's findings as a guide to produce more studies that will be more beneficial. They can use this study as a reference or improve on it in the future.

Secondly, the findings in this study allow undergraduate students to understand their peers' attitudes toward willingness to adopt CBDC. It is common for people to be influenced by their peers' behaviors. The result could have an impact on change in willingness to use CBDC. It also increases the awareness of future trends of payment among undergraduate students, so they can be open-minded to

technological innovation and be prepared for changes such as learning financial knowledge.

Thirdly, this study can help academic institutions in improving teaching materials to increase the willingness to adopt CBDC. There is a necessary purpose to conduct this research because this study is to investigate potential futures for digital money in relation to existing implementations' concepts and underlying technology (Soderberg et al, 2023). This study emphasizes undergraduates who are more familiar with technology because they are born in a technology-booming era. Besides, undergraduate students who are well-educated can have a higher openness to change. Understanding the attitudes of the population with greater technology acceptance could help institutions to identify the gap to improve the CBDC adoption willingness.

1.7 Layout of Chapter

The current chapter contains background of this research and statement that describes the issues of the study to explain the reason for conducting this study. Then, five research objectives, followed by questions, together with hypotheses are established. Lastly, the significance study is elaborated.

Chapter two explores the four underlying theories related to the five independent variables and also a literature review from previous studies regarding all variables including one dependent variable and five independent variables. The review covers definitions, theories, and studies' findings for each variable. Lastly, a conceptual framework and five hypotheses are constructed.

Chapter three explains the approaches to conduct study such as research design, sampling design, method to collect data, and proposed tools for analysis. The steps are explained respectively.

Chapter four presents the data findings of this study by presenting numerical values and diagrams. The results from preliminary screening, descriptive analysis, and inferential analysis are shown in an organized sequence.

Chapter five concludes and discusses the findings. Next, the implications and limitations of this study are pointed out. Besides, recommendations are made as advice for future study.

1.8 Conclusion

In conclusion, CBDC is a cutting-edge tool that is full of arguments about its implementation as it brings benefits with certain costs. The effects of not having CBDC include financial crime, informal economy, ineffective monetary policy in countries, concern about privacy, financial knowledge, innovation, regulatory and security factors by the public, as well as financial inclusion by students. Hence, the conducted study in this writing is to investigate and identify the association between the five regressors and willingness to adopt CBDC among undergraduate students in UTAR.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

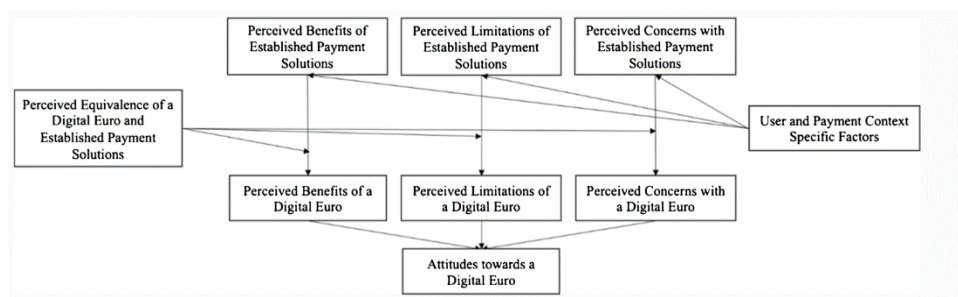
The second chapter of this study first identified theories related to independent variables. Then, literature assess is done on both the regressand and independent variables, including privacy factor, financial knowledge, openness to innovation, regulatory factor, and security factor. Thirdly, a conceptual framework is developed that explains the hypotheses development constructed in this study.

2.1 Theories

2.1.1 Extended Attitude Formation Theory

Figure 2.1

Extended Attitude Formation Theory



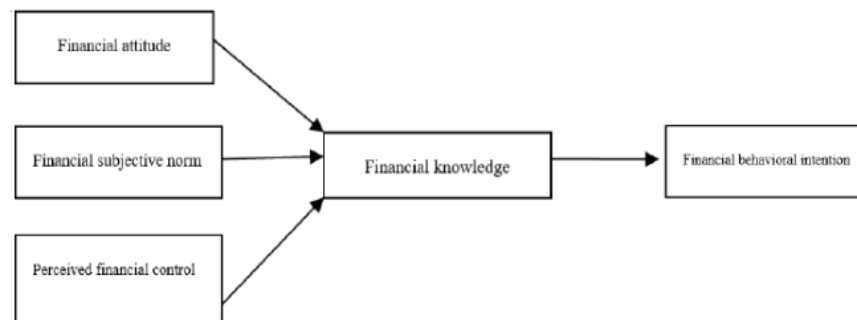
Sources: Tronnier et al (2023).

Tronnier et al. (2023) use the extended attitude formation theory to explain that the privacy factor can influence the willingness to adopt CBDC among the citizens due to the majority of CBDCs have not yet been distributed to end users in most countries, and the technological approaches and design elements that have been disclosed vary greatly from one central bank to another, causing difficulty to end users in accurately assessing variables that are included in such models and the individuals are unable to accurately judge some criteria, such as performance expectations and perceived simplicity in use. Therefore, CBDC must combine the perceived advantages of alternative ways to pay with the abolition of their drawbacks and the alleviation of consumers' worries in order to outperform currently available alternatives under this scenario.

2.1.2 Ajzen's Theory of Planned Behavior

Figure 2.2

Theory of Planned Behavior



Sources: Shih et al. (2022).

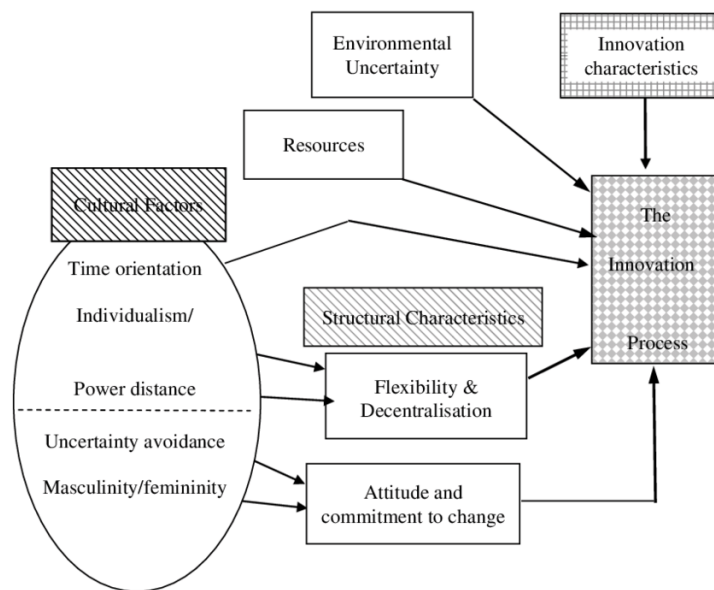
Khairul (2022) mentioned that if the citizens have good financial knowledge, it can enhance the development of CBDC because people are more willing to try out things that are well known. Besides that, Ajzen's

Theory of Planned Behavior has been identifying that it is a useful way in any context because knowledge is the fundamental criteria (Knabe, 2012). Next, this theory was used to examine financial knowledge whether it is significantly and favorably correlated with behavioral intention in studies conducted by Shih et al. (2022). This theory is being applied because it will give attention to financial education and interventions that are related to CBDC. It can enhance financial knowledge for teenagers to improve the development of CBDC (She et al., 2023).

2.1.3 Hofstede’s Cultural Dimension Theory

Figure 2.3

Hofstede's Cultural Dimension Theory



Source: Rujirawanich et al. (2011)

Hofstede (1980), a Dutch management researcher first introduced this theory to study the variety of cultures in different dimensions. There were originally four dimensions covered. The dimension of uncertainty

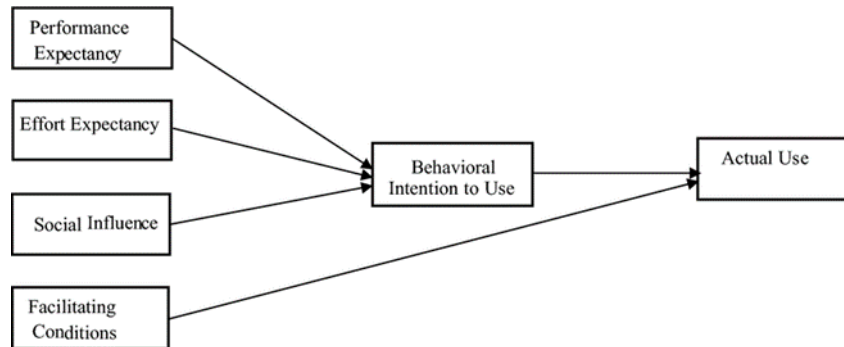
avoidance is particularly discussed because it is related to openness to innovation. There are two choices which are either to avoid or accept uncertainty, and this dimension examines the degree of tolerance for uncertainty from new and undiscovered things. Rujirawanich et al. (2011) and Jan et al. (2022) utilized Hofstede's Cultural Dimension Theory in the TAM model to learn the adoption patterns.

In empirical studies, openness to innovation is commonly related to the behavioral intention to find the relationship between them by the researchers. For example, Van et al. (2002) examine the effect of perceived innovation on adopting groupware, Noraini et al. (2014) predict the intention to use Malaysian EduwebTV using the acceptance of technological innovations, while An et al. (2023) studied the personal innovativeness to order food through mobile food delivery applications. For a study related to factors affecting the willingness to adopt CBDC, Hofstede's Cultural Dimension Theory was applied by Wu et al. (2022) to study the association and correlation between individual behaviors on willingness to try new things (openness to innovation) and the desire to use CBDC.

2.1.4 Unified Theory of Acceptance and Use of Technology

Figure 2.4

Unified Theory of Acceptance and Use of Technology



Source: Marikyan & Papagiannidis (2023)

The theory of accepting or rejecting the use of new technologies has been widely discussed since the 20th century. With the advancement and development of science and technology, people are always resistant and unwilling to accept new technologies. That's why theorists and researchers focus on understanding how a new user is willing to accept a new technology, how they could use it, and what important factors would stop them or motivate them to continue using the new technology (Momani, 2020). In history, this theory was developed from eight different theory that explained the acceptance of use of technology (Wedlock & Trahan, 2020). The diagram above shows the theoretical framework developed to explain the theory mentioned. According to Venkatesh et al. (2016), the theory could be explained into four important components. Performance expectancy explains how an individual can use the new technology to enhance his or her work performance. Effort expectancy explains how an individual is able to use the new technology to make his or her work easier. Social Influence explains how an individual realizes the importance of this new technology when he or she starts to use it. Lastly, the facilitating

conditions explain how an individual going to believe the usage of the new technology when it has large organizations or systems to support it.

Central Bank Digital Currency (CBDC) as a new financial technology product contains complexity and innovation that requires individual support in order to launch to the society. It is concluded that the UTAUT acts as the most effective theory that is able to explain the intention of using a new technology for an individual (Susanto et al., 2020). Gupta et al. (2023b) present that the components of the UTAUT provide both positive and negative influences on the adoption of CBDC in a country. For example, it is concluded that performance expectancy and social influence provide the positive influence while the perceived risk provides the negative influence. Abass (2022) used UTAUT under the social influence factors to identify whether factors such as security, privacy, reversibility, and speed of transactions are able to affect the willingness to adopt CBDC in the country of Ireland. It is clarified that blockchain technology that backs up the security system of central bank digital currency highly reduces the cybersecurity risk and that leads to an increase in the attractiveness of CBDC to individuals (Yang & Li, 2020). Furthermore, it is important that the central bank should consider regulatory factors in the adoption of CBDC (Walter & Siu-Cheong, 2017). Gupta et al. (2023b) mentioned the actual use components of the UTAUT which if the regulatory system is able to provide security to its users, then people tend to adopt CBDC. A conclusion to be made is that UTAUT is able to explain the security factor and regulatory factor of our research.

2.2 Review of Variable

2.2.1 Willingness to Adopt CBDC

Many studies have focused on the issues of CBDC to dig up the factors affecting the willingness to adopt CBDC.

According to Bindseil (2020), CBDC is defined as an electronic form of money that is regulated by the central bank and used to provide for public usage. Ngo et al. (2023) claimed that CBDC is a policy-making tool that can help the government improve a country's economic efficiency. Nowadays, the desire for the research on issue of the willingness to adopt CBDC has heightened due to the benefit provided by it to society. The research on the factor that affects the willingness to adopt CBDC has been widely discussed. Based on previous empirical studies, it is summarized that the factor that affects the willingness to adopt CBDC in a country include privacy factor, financial knowledge, openness to innovation, regulatory factor, and security factor.

It is widely recognized that financial knowledge and openness to innovation are the important factors that directly affect the willingness to adopt CBDC in a country. Based on the previous empirical studies, it is shown that financial knowledge and openness to innovation was significantly correlated with the willingness to adopt CBDC in a country. According to Bijlsma et al. (2021), it is mentioned that an individual with knowledge of CBDC is more willing to open a CBDC operation account for daily transactions. Kim et al. (2022) mentioned individuals with low openness to innovation will not be likely to adopt CBDC for their daily transactions as their low openness attitude will lead them to have low interest in facing uncertainty. However,

over time, the financial knowledge and the openness to innovation cannot fully describe the willingness to adopt CBDC. Other personal factors should be included in the factors that affect the willingness to adopt CBDC in a country. According to previous studies, the privacy factor, regulatory factor, and security factor show a significant relationship with the willingness to adopt CBDC in a country. Gupta et al. (2023b) mentioned that individuals are more concerned about privacy while using CBDC as they are afraid their financial and transaction information get stolen by others. Mack (2022) mentioned that regulatory factor is able to increase the credibility of using CBDC. However, a strict regulatory system on CBDC decreases the interest of the CBDC users to use it for daily transactions. For the security factor, it is argued that if CBDC users feel they are not secure in using CBDC, their willingness to adopt CBDC in a country will decrease (Kahn & Rivadeneyra, 2020). From several previous studies conducted by researchers, it is clarified that the financial knowledge, openness on innovation, privacy factor, regulatory factor, and security factor have a significant relationship on the willingness to adopt CBDC in a country.

Unfortunately, there is a lack of research on the combination of five factors on the willingness to adopt CBDC among undergraduate students in Malaysia, which is closer to our life. Undergraduate students have been recognized by society as individuals that have higher willingness and openness to the acceptance of new technology. The study conducted will analyze the factors that will impact the willingness to embrace CBDC among undergraduate students in UTAR with relevant data and theories support.

2.2.2 Privacy Factor

The literature review of previous studies showed mixed results on the relationships between privacy factor and the willingness to adopt CBDC.

For CBDC, privacy is a critical consideration. It is regarded as a prerequisite for the acceptance of funds that must be given to CBDC (Tronnier et al, 2023). The significance of privacy and the necessity to strike an equilibrium between protecting the public's privacy and preventing illicit conduct have both been consistently emphasized by the Bank for International Settlements. All of the aforesaid central banks, governmental organizations, non-governmental organizations (NGOs), think academics and members of the general public appear to concur that privacy is crucial and that, if the central bank chooses to publish a CBDC, it ought to craft the CBDC to be private preserving (Jiang, 2023).

Gupta et al. (2023a) claimed that privacy factors significantly and positively influence the willingness to adopt CBDC. It mentioned that the adoption of technology is typically hampered by privacy concerns in systems of information development. CBDCs may transform the financial system and affect how private individual payments are. For example, a hacker jeopardizing is known as a security risk. CBDC is not exempt from the need for adequate security technologies to safeguard its users' sensitive data. As the CBDC has the potential to alter the structure of the financial system, privacy has become a major worry. People's intentions to create a CBDC bank account are positively correlated with how much they value confidentiality. Central banks are the primary developers of CBDC, and they hope that consumers will use it to secure their personal information and funds from fraud and theft because of its potential resilience against interruption (Bijlsma et al., 2021). Although essential, user confidentiality is not the only problem that central banks must take into consideration when

developing a CBDC. Other policy objectives of central banks include enhancing financial inclusion, preserving financial stability, and establishing a vibrant and competitive financial market. Because of this, central banks have to make certain privacy sacrifices when attempting to achieve other privacy objectives. Therefore, privacy factor negatively correlated with willingness to adopt CBDC (Jiang, 2023).

In conclusion, there is a mixed relationship between CBDC and privacy factors for the users. If there is high privacy protection in CBDC, the number of willingness to adopt CBDC in Malaysia must be increased and enhance the development speed in Malaysia.

2.2.3 Financial Knowledge

The literature review of previous studies showed that financial knowledge has two types of relationship with the willingness to adopt CBDC.

In previous study, financial knowledge is found to be positively affecting adoption of CBDC among Malaysian citizens (Amarta & Latifah, 2023; Wu et al., 2022). Every person should understand and be proficient in financial literacy since it has an impact on one's financial situation and impacts the ability to make wise and informed judgments about the economy (Amarta & Latifah, 2023). Financial literacy is currently defined by The Organisation for Economic Cooperation and Development as an assortment of financial understanding, understanding, abilities, mindsets, and behaviors required to make intelligent financial choices and eventually achieve personal financial security. A person who is financially literate is aware of the ways to make, manage, and trade money. He is knowledgeable about financial goods and

uses his expertise to his advantage. In contrast, financial knowledge is found to be negatively impacting willingness to adopt CBDC (Pytaylo, 2023). In the study, questions related to knowledge or awareness of CBDC and acceptance of CBDC as a new form of payment were asked according to the country's economic status either an advanced economics (AEs) or an emerging market and development economics (EMDEs). The findings in this study are that respondents from AEs are more knowledgeable in CBDC but respondents from EMDEs are more willing to adopt CBDC. This is because people in AEs are satisfied with their current living conditions and less willing to make a change, while people in EMDEs desire to change their unstable economy to improve their living conditions through the adoption of CBDC.

In conclusion, financial knowledge has a positive relationship with CBDC. If the citizens have a higher financial knowledge, it can increase their willingness to adopt CBDC in Malaysia. Besides, a negative relationship has been presented because of high education associated with a wealth country's economic status that does not need the adoption of CBDC.

2.2.4 Openness to Innovation

The literature review of previous studies showed mixed results on the relationships between the openness to innovation and the willingness to adopt CBDC of an individual.

Openness to innovation can be referred to the extent of willingness to experience innovation in technology (Wu et al., 2022). This is associated with uncertainty acceptance because readiness to accept innovation is

equivalent to willingness to encounter uncertainty; thus, it will influence the intention to adopt a new thing. Kim et al. (2022) claimed that people with high openness to innovation are more willing to adopt CBDC because they will learn more related knowledge which enhances their evaluating and judging abilities. In contrast, people with low openness to innovation are less likely to have the intention to adopt CBDC because CBDC is an innovative technology with limited practical implementation in the world which leads to high uncertainty. Hence, it is expected that openness to innovation is positively correlated with willingness to adopt CBDC.

From the empirical studies, it is found that openness to innovation positively affects intention to utilize CBDC (Wu et al., 2022). Findings from Kim et al. (2022) also show consumer innovativeness as a significant factor affecting desire to use CBDC in hospitality and tourism sectors. These results match the theory's expectations. On the other hand, there could be a negative relationship between openness to innovation and perception of new technology proven in the research by who examine the relationship using the TAM model (Pishnyak & Khalina, 2021). In their findings, a person who has an openness to innovation could still be unwilling to adopt new technology due to low-income issues or provided that the new technology is considered a luxury product.

For sample data collected, 408 respondents in China who are aged 18 and above with high usage of the Internet were investigated by Wu et al. (2022) because China is one of the countries that have implemented the pilot test of using CBDC. Apart from that, Kim et al. (2022) use the data collected from 423 individuals who heard about CBDC innovation and bought products in the hospitality and tourism sectors in a fixed time.

For analysis methodology, explanatory factor analysis is used by Wu et al. (2022) to examine convergent and discriminant validity. Besides,

confirmatory factor analysis is also used by Wu et al. (2022) and Kim et al. (2022) to obtain the result of goodness-of-fit indices and others. Next, structural equation model analysis is applied by Kim et al. (2022) as well. Lastly, a binary logistics regression model is applied by Pishnyak and Khalina (2021).

In brief, positive relationship could occur because it is believed one who accepts change is more likely to try new technology. Meanwhile, a negative relationship could occur because poor people are unable to afford a luxury technology.

2.2.5 Regulatory Factor

The literature review of previous studies showed mixed results on the relationships between the regulatory factors and the willingness to adopt CBDC by an individual.

Throughout history, regulatory compliance, or regulation presents different meanings to different individuals. Some individuals think that regulation is a bad thing that is used by high authority to show his power and dictatorship to control the freedom of human beings; while some individuals are satisfied that regulation acts as a legal enforcement tool that is able to help the country monitor individual's behavior in order to prevent themselves include in illegal activity (Levi-Faur, 2010). In the financial industry, regulators have the responsibility to ensure the regulation is designed to provide the function of protecting the consumer, maintaining the country's financial stability, and improving market efficiency (Allen et al., 2022). A regulatory framework can help CBDC users to enjoy the benefits of data regulation and privacy protection (Wang & Gao, 2023). CBDC users were

paying more attention on the regulatory system before adopting it in their future lives. According to Walter and Siu-Cheong (2017), a central bank that comply Know-Your-Customer and avoid money-laundering would highly increase the attractiveness of that central bank digital currency (CBDC). However, some researchers found that strict regulatory compliance will increase the compliance cost and force CBDC users to find a way to have avoidance of rules.

According to Cheng (2022), regulatory factor shows a positive relationship with the adoption of CBDC in an individual. While Cheng (2022) focused his studies on China's digital currency e-CNY mentioned that the high quality and high transparency of lawful rule such as Cybersecurity Law, eliminate the anonymity nature of the e-CNY since all the transactions have been recorded and tracked. Besides, Maryaningsih et al. (2022) conducted a study for both emerging countries and advanced countries on the adoption of CBDC stating that if the central bank or regulation parties implement less stringent regulations, the individual will be more likely to adopt CBDC in their economic activities. However, Mack (2022) and Gupta et al. (2023a) identify a negative relationship between the regulatory factor and the adoption of CBDC by an individual. Gupta et al. (2023a) focused their studies on the Indian digital currency rupee while Mack (2022) focused his studies on the U.S. central bank digital currency. Both parties provide the same claim that fragmentation and overlap in the regulatory system were the reasons that slowed down the adoption of CBDC in the country. Incomplete regulatory frameworks reduce the confidentiality of the individual to use their country's digital currency for daily transactions in the future. There is also research stating that regulatory factors do not affect the adoption of CBDC for an individual.

In conclusion, the mixed results in previous studies might be due to the different stages of the development of regulatory systems for each central bank digital currency. Well-developed and highly transparent regulatory

systems positively influence the willingness to adopt the CBDC of an individual, while fragmentation and overlap in the regulatory system will negatively influence the willingness to adopt the CBDC of an individual. Besides, the tolerance from central bank to its users on design of regulation framework also highly affected the adoption of CBDC for an individual. It is concluded that individuals tend to have less control by regulation when using CBDC for both emerging countries and well-developed countries.

2.2.6 Security Factor

The literature review of previous studies showed mixed results on the relationships between the security factors and the willingness to adopt CBDC of an individual.

In the physical world, security describes how individuals are able to protect themselves, how individuals prevent themselves from theft, and how self-freedom and safety are guaranteed (Brooks, 2009). In the digital world, security is built based on the trust developed between two parties. Digital security is highly different compared with physical security due to its complexity and it is more concerned about privacy and freedom matter instead of the safety of an individual (Redmiles et al., 2016). In the financial industry, virtual currency as a newly emerged FinTech product requires high-quality technology such as blockchain in order to ensure security behavior. It is noticed that successful security behaviors are able to break through the noise and attract the usage of new innovation (Mori, 2016). As a result, CBDC as one of the virtual currencies should highly focus on the security factor in order to execute adoption in a country. According to Hansen and Delak (2022), the security factor from the CBDC perspective plays an important role in building trust and protecting personal information for users and central banks. It is mentioned that failure in security

management for CBDC not only decreases its adoption in a country but also reduces the reputation of a central bank, leading to serious negative economic effects such as monetary and financial instability etc.

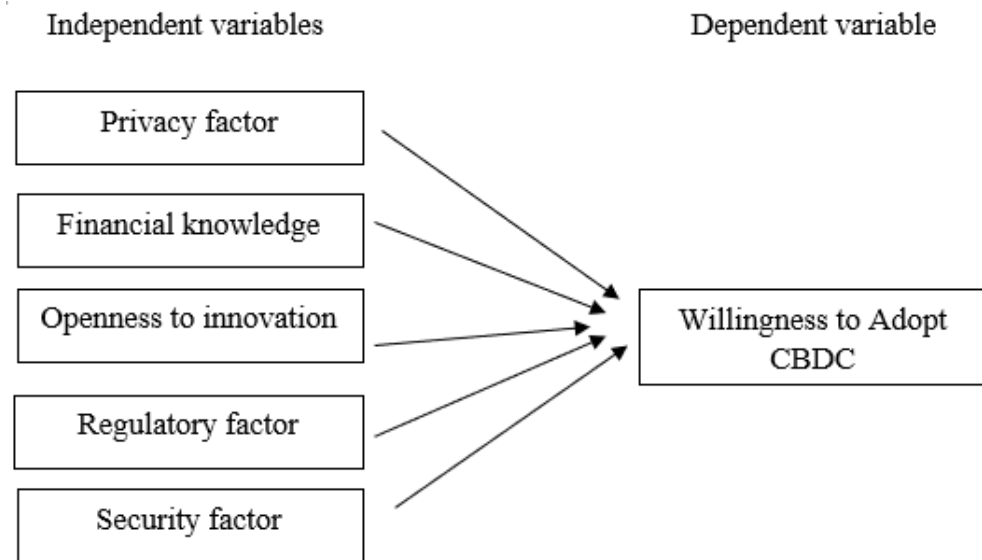
According to Gupta et al. (2023b), Kahn and Rivadeneyra (2020), their research identify a negative relationship between the security factor and the adoption of CBDC by an individual. It is argued by Gupta et al. (2023b) and Kahn and Rivadeneyra (2020) that individuals are afraid their personal information will not be secured by the central bank while using CBDC. Individuals tend to use cash notes and coins as they have full control over the physical items that they hold. However, Gupta et al. (2023b) mentioned that individuals that having previous experience in digital currency or fintech products react positively to the use CBDC because of security factor. The research used the Unified Payments Interface as previous experience and mentioned that individuals who have far more understanding of the standard rules and procedures on a digital currency will tend to have more confidence to adopt CBDC from a perspective of security factors. Besides, research conducted by Martens (2021) about the demand for using three kinds of payments which include cash, cryptocurrency, and CBDC, CBDC is able to get the highest demand due to security factors. Therefore, it is concluded that the security factor has positively influenced the adoption of CBDC in his/her research.

In conclusion, the mixed results in previous studies were due to the existence of previous experience with related products. If an individual has experience in using digital currency-related products, the security factor will have a positive relationship against the willingness to adopt CBDC. If an individual does not have any experience in using digital currencies-related products, the security factor will have a negative relationship against the willingness to adopt CBDC.

2.3 Conceptual Framework

Figure 2.5

Conceptual Framework



Source: Combination of theoretical framework from this study

Based on the underlying theories section, a conceptual framework has been formed above to study the factors affecting willingness to adopt CBDC among undergraduate students in UTAR. This conceptual framework involves five independent variables which are the privacy factor, financial knowledge, openness to innovation, regulatory factor and security factor. Based on the previous studies by many researchers, it has been verified that these five independent variables have a significant relationship with willingness to adopt CBDC. Therefore, this framework will be used to examine whether the inference is correct with a more specific observation group which is undergraduate students in UTAR.

2.4 Hypotheses Development

2.4.1 Privacy Factor and Willingness to Adopt CBDC

The findings from Gupta et al. (2023b) show a positive relationship between privacy factor and willingness to adopt CBDC.

Privacy factor or in other words, digital privacy is the degree of freedom that allows users to take control of their personal information and rights on the Internet (Robertson & Corrigan, 2018). Due to the rise of social networks and electronic payment platforms, high chance of individual personal information getting viewed by unknown persons due to public sharing and unauthorized access. People tend to have different opinions on the privacy factor such as some people believe that personal privacy and information should be kept confidential, while some people able to accept their privacy get viewed by others Lewis et al. (2008). According to the research conducted by Corradini and Nardelli (2020), it is mentioned that students are more concerned about the privacy factor while using digital currencies or electronic payments compared with other individuals. It is because students have more digital awareness compared to others that are able to secure them from information theft and unauthorized access. Therefore, it is concluded that undergraduate students were suitable for choice as targeted populations which explains the relationship between the privacy factor and the willingness to adopt CBDC.

In summary, a direct relationship exists between the privacy factor and the willingness to adopt CBDC for an individual, especially for teenagers like students. Thus, the hypothesis developed is:

H1: The UTAR's undergraduate students have a significant association between the privacy factor and their willingness to adopt CBDC.

2.4.2 Financial Knowledge and Willingness to Adopt CBDC

Financial knowledge or financial literacy explains the understanding of an individual's financial theory and concept that is able to help them make their daily financial decision (Asaad, 2015). Devi and Gupta (2023) indicate that 70 to 80 percent of Bareilly and Golconda citizens are not willing to shift their physical not to CBDC as they do not have relevant knowledge on it. It is concluded that students especially undergraduate students have more financial knowledge compared to other individuals. The reason provided by Jobst (2012) stated that the undergraduate period is most likely the last period that an individual obtains financial knowledge from an institution. Besides, finance courses provided by academic institutions highly increase the awareness of students by having good financial behavior (Borden et al., 2007). Therefore, it is concluded that undergraduate students were suitable for choice as targeted populations that explain the relationship between financial knowledge and the desire to use CBDC.

Two studies found that financial understanding positively correlated with willingness to adopt CBDC (Amarta & Latifah, 2023; Wu et al., 2022). This indicates that one with higher financial knowledge who understands how the CBDC works is more likely to adopt CBDC. Furthermore, a negative relationship between financial knowledge and the adoption of CBDC is found by Pytalyo (2023) because of the stable economy in advanced countries that have highly knowledgeable citizens, reducing the need for CBDC.

In summary, a direct relationship exists between financial knowledge and the willingness to adopt CBDC for an individual, especially for teenagers like students. Thus, a hypothesis developed as below.

H2: The UTAR's undergraduate students have a significant association between financial knowledge and their willingness to adopt CBDC.

2.4.3 Openness to Innovation and Willingness to Adopt CBDC

From the firm perspective, it is concluded that higher openness to innovation allows a country to adopt new technology that is able to help their firm obtain technology transformation and leads them to higher profit in a long-term manner (Roper et al., 2013). From the CBDC perspective, it is mentioned by Maryaningsih et al. (2022) that higher openness to innovation will lead to faster progress in the adoption of CBDC either for emerging countries or advanced countries in the world. In order to measure the willingness to adopt CBDC based on the independent variable openness to innovation, students are more suitable to present the targeted population compared with another individual. This is because innovative tasks provided to undergraduate students allow them to have more freedom and independence to make decisions (Martin et al., 2017). Besides, undergraduate students are free to communicate with others in an open environment which leads them to have higher innovative behavior (Roffeei et al., 2018). Therefore, it is concluded that undergraduate students were suitable for choice as targeted populations that explain the relationship between the openness to innovation and the willingness to adopt CBDC.

Studies by Wu et al. (2022) and Kim et al. (2022) indicate openness to innovation significantly associated with willingness to adopt CBDC in China and Korea among citizens above 18 years old in related fields respectively. On the other hand, Pishnyak and Khalina (2021) found that there is a negative relationship between openness to innovation and perception of new technology.

In summary, a direct relationship exists between the openness to innovation and the willingness to adopt CBDC for an individual, especially for teenagers like undergraduate. Hence, a hypothesis is constructed as below:

H3: The UTAR's undergraduate students have a significant association between openness to innovation and their willingness to adopt CBDC.

2.4.4 Regulatory Factor and Willingness to Adopt CBDC

Regulating a digital currency must provide the function of protecting the consumer to prevent data and privacy information theft from others (Allen et al., 2022). A well-complete regulatory framework of central bank digital currency is able to reduce to chance of privacy spread, information counterfeiting, and suspicion from others including in money laundering activities (Schwarcz, 2022). In order to measure the willingness to adopt CBDC based on the independent variable regulatory factor, students are more suitable to present the targeted population compared with other individuals. Research about understanding of Cyber Business Law related to digital currency conducted by Horton et al., (2018) stated students are knowledgeable about digital currency but still need to improve in the future. Besides, the studies imply the result that students also have the willingness

to continuously learn the technology of digital currency. Besides, Devi and Gupta (2023) stated that Indian students also show their legal awareness about digital currency mentioned the country still does not have any law that protects their personal data and private information. Therefore, it is concluded that undergraduate students were suitable for choice as targeted populations that explain the relationship between the regulatory factor and the willingness to adopt CBDC.

High quality and high transparency of regulatory frameworks provide the protection that CBDC users deserve highly increase the adoption of CBDC for an individual (Cheng, 2022). Moreover, it is also attractive that the central bank provides less stringent regulations to CBDC users when using it (Maryaningsih et al., 2022). Conversely, incomplete, overlap, and fragmentation of regulatory frameworks for the adoption of CBDC confuse its users and then will lead to a reduction in the confidentiality of using CBDC to an individual (Mack, 2022) (Gupta et al., 2023a).

In summary, a direct relationship exists between the regulatory factor and the willingness to adopt CBDC for an individual, especially for teenagers like students. Therefore, a hypothesis development has been formed:

H4: The UTAR's undergraduate students have a significant association between the regulatory factor and their willingness to adopt CBDC.

2.4.5 Security Factor and Willingness to Adopt CBDC

Security was built based on the trust developed between the two parties. Digital security is highly different compared with physical security due to its complexity and it is more concerned about the privacy and freedom matter instead of the safety of an individual (Redmiles et al., 2016). In order to measure the willingness to adopt CBDC based on the independent variable security factor, students are more suitable to present the targeted population compared with another individual. A study conducted by Athey et al. (2017) examines how MIT students behave in securing their digital wallets. It is shown that 55% of MIT students are willing to take an extra step to implement PGP encryption technology on their digital wallets to prevent third-party peeking the transaction and communication content between the sender and receiver. This is able to show that students were more caring about the security factor while using digital currency compared to other individuals. Therefore, it is concluded that undergraduate students were suitable for choice as targeted populations that explain the relationship between the security factor and the willingness to adopt CBDC.

Users who have previous experience in using digital currency and fintech products are more willing to adopt CBDC as they are more familiar with the standard of procedure on security matters (Gupta et al., 2023a). Conversely, individual tends to use physical cash notes instead of CBDC because they are afraid of central banks not being able to protect their personal information when using it (Gupta et al., 2023b; Kahn & Rivadeneyra, 2020).

In summary, a direct relationship exists between the security factor and the willingness to adopt CBDC for an individual, especially for teenagers like students. Therefore, a hypothesis development has been formed:

H5: The UTAR's undergraduate students have a significant association between the security factor and their willingness to adopt CBDC.

2.5 Conclusion

The literature review has defined the variables and explained the connection between the five independent variables and willingness to adopt CBDC theoretically in theories and empirically through research. Hence, a conceptual framework is constructed by combining each variable, and hypotheses are proposed for each independent variable.

CHAPTER 3: METHODOLOGY

3.0 Introduction

The current section explains procedures in achieving this study's objectives, examining what are the factors affecting the degree of desire to adopt CBDC among undergraduate students in UTAR. First, research design is introduced, followed by sampling design and data collection methods. Next, analysis tools are proposed including the preliminary screening and inferential analysis.

3.1 The Design of Research

Akhtar (2016) defines design of research as the main structure of research that includes several elements and components that can assist the researcher in planning their research for further purposes. The types of research have been divided into two types which are quantitative research and qualitative research.

Mertens (2010) mentioned that quantitative research provides the function of verifying the significant correlation between explanatory variables and response variable, while qualitative research aims to collect personal information and opinions by conducting physical meetings. In this study, we aim to find the significant relationship between the willingness to adopt CBDC and the five factors that affect it which include privacy factor, financial knowledge, openness to innovation, regulatory factor, and security factor, so it is recommended that this study is conducted through quantitative research.

In this paper, we have used quantitative research by providing a questionnaire to our respondents. According to Weiers (2010), the questionnaire can be divided into three types which are multiple-choice questionnaires, open-ended questionnaires, and close-ended questionnaires. This study was conducted by a close-ended questionnaire with a 5-point Likert scale as it can fix the range of the answers and data collected from our respondents.

3.2 The Design of Sampling

3.2.1 Target Population

Barnsbee et al. (2018) define a target population and mention that it is an individual group that can influence a study result by providing specific performance. The study's objective aims at examining elements influencing the desire to adopt CBDC among undergraduate students in UTAR. According to Amarta & Latifah (2023), students have the highest influence power on the willingness to adopt CBDC as they are more willing and open and have more knowledge to accept new technology that is publicized to society. Thus, UTAR Kampar's undergraduate students are being selected.

3.2.2 Sampling Frame and Sampling Location

Sampling location mentions places or locations for the researcher to collect data such as quantitative data or qualitative data. As our target population selected for this study is undergraduate students in UTAR, we have a specific sampling location at the UTAR Kampar campus. The reason we

have chosen the UTAR Kampar campus is that UTAR has two campuses, another one is located at Sungai Long.

3.2.3 Sampling Elements

Element is component of individual from target population. In research, a sample of the population will be selected and subjected to a specific sampling procedure before being subjected to analysis. The respondents chosen are diverse based on gender, age, faculty, current academic year, mobile/Internet experience and online payment experience.

3.2.4 Sampling Technique

Bhardwaj (2019) stated that various techniques that are used to sampling the raw data has been summarized and differentiated into two group, and both are suitable for research purposes which include probability sampling techniques such as simple random sampling and non-probability sampling techniques such as convenience sampling (Taherdoost, 2020). The sampling technique that was going to be used was convenience sampling in the section of non-probability sampling. Even though probability sampling techniques are more suitable for cases of quantitative research as it is able to handle many populations and divide them into several small groups, convenience provides us the opportunity to gather the data in an easier way by collecting from friends or family through a digital platform (Rahman et al., 2022). Time constraints, low cost, and ease to meet the targeted population were the reasons for us to implement this sampling technique.

3.2.5 Sampling Size

The number of samples required has been calculated based on Taro Yamane Sample Size formula. In this formula, we are going to identify several variables which include the sample size (n), population size (N), and margin of error (e). The population size that we collected was based on the number of undergraduate students in UTAR which is about 20,000 students (Study Malaysia, n.d.). For the margin of error, it is mentioned that the range of sampling error that allows for our study has been set as 0.05. After calculating, the number of samples required is equal to 393.

Following formula (Iddon, 2023) and calculation were the sample size of this research required:

$$n = \frac{N}{1 + N(e)^2}$$
$$n = \frac{20,000}{1 + 20,000(0.05)^2}$$
$$n = 392.16$$
$$n \approx 393$$

3.3 Data Collection Method

Primary data and secondary data are the only two types of data suitable for academic research. In this study are going to use primary data.

3.3.1 Primary Data

According to Wagh (2023), primary data has been described as the first-hand data obtained by the researcher through a survey, interview, or experiment. This can ensure the data is up-to-date and more reliable, so primary data is used for this study. However, the cost of gathering data is higher than secondary data and consumes more time. In order to collect a huge amount of data in a short time from a large sample size, we decide to use questionnaires to conduct our primary research. In our questionnaire, respondents just require 15-20 minutes of time to answer our survey question. The survey questions will be conducted by Google Forms and will be sent to our targeted population through Microsoft Teams.

3.3.2 Research Instrument

3.3.2.1 Questionnaire

Online questionnaire such as Google Forms is the research instrument used in this study to collect data. Wagh (2023) claimed that a survey can easily gain information from a large number of people at a low cost. Besides, there are many sample questionnaires available from previous studies which will ease the construct of the question. This research instrument has been used in previous studies by Gupta et al. (2023a), and Wu et al. (2022). In this study, there are three sections in the questionnaire with a cover layout. Section 1 aims to collect six demographic data which are gender, age group, faculty, year of study, mobile/Internet experience, and online payment experience. Apart from that, section 2 to section 6 consist of questions regarding independent variables including privacy factor, financial knowledge, openness to innovation, regulatory factor, and security factor.

Lastly, section 7 measures the willingness to adopt CBDC respondents. Five-point Likert scale is used in section 2 to section 7 because it can indicate the extent of the agreement clearly which makes the analysis convenient (Mcleod, 2023).

3.3.2.2 Pre-test

The questionnaire was reviewed by a lecturer of UTAR Kampar Campus before being distributed.

3.3.2.3 Pilot test

Hamilton (2023) defined a pilot test as a test or experiment conducted through electronic devices to observe the reliability and performance of the study by comparing the cost and results generated. As a questionnaire has been used in this study, the main usage of the pilot test is to examine the accuracy, quality, and correctness of the questionnaire provided to the respondents. The pilot test has been conducted for 1 week starting at week 7 and ending at week 8. In this study, 30 sets of questionnaires have been prepared and provided to our respondents. The channel used for sending questionnaires to our respondents was Microsoft Team. After the period of collecting data, the results were analyzed in the SPSS 26.0 software to verify the statistical data such as Cronbach alpha to test the reliability test.

3.3.3 Scale of Measurement

The measurement scale is the type of information with different meanings after numbering (Lee, 2014). The nominal scale, ordinal scale, and interval scale are the three scales of measurement used in this study.

3.3.3.1 Nominal Scale

A nominal scale is used to classify qualitative variables with no ranking or value. For example, gender either male or female (Mishra et al., 2018). In this study, gender is used as the nominal scale.

3.3.3.2 Ordinal scale

The ordinal scale is used to classify qualitative variables with ranking but does not have equal numerical measurement point difference. The age group is treated as an ordinal scale because there is a natural order as it is in the group which does not tell accurately the specific age (Zach, 2021). Hence, the age group has been used as an ordinal scale as below:

Age Group
Below 25 () 25 and above ()

3.3.3.3 Interval Scale

This scale is used to classify quantitative variables with numerical measurement differences but with no true zero value. For example, the agreement to a statement (Mishra et al., 2018). Therefore, the interval scale has been used in the 5-point Likert scale for all queries about regressor and regressand.

3.3.4 Origin of Construct

Table 3.1:

Summary of Questionnaire Source from Previous Studies

Variables	Sources	Items	Cronbach's Alpha	Scale
Dependent variables: Willingness to adopt CBDC	Wu et al. (2022)	5	0.856	5
Independent variable: Privacy factor	Gupta et al. (2023b)	4	0.847	Likert Scale
	Abass (2022)	2	0.87	7 Likert Scale
Independent variable: Financial knowledge	Wu et al. (2022)	5	0.861	
Independent variable: Openness to innovation	Gupta et al. (2023a)	4	0.839	5
	Wu et al. (2022)	5	0.831	Likert Scale
Independent variable: Regulatory factor	Gupta et al. (2023a)	3	0.769	
	Xia et al. (2023)	2	-	-
Independent variable: Security factor	Gupta et al. (2023b)	3	0.804	5 Likert Scale
	Xia et al. (2023)	3	-	-

3.3.5 Measurement of Independent Variables and Dependent Variable: Operational Definition

3.3.5.1 Willingness to Adopt CBDC

The willingness to adopt CBDC refers to the degree of willingness to use CBDC in Malaysia. The scale is adapted from Wu et al. (2022). The questions consist of “I will use CBDC if given the opportunity to do so” and “I will use digital currency on a regular basis in future.”

3.3.5.2 Privacy Factor

Privacy factor refers to the concerns of keeping the CBDC users’ information confidential. This variable is measured by Gupta et al. (2023b). The example questions are “I am worried that my personal information will be secure when I use the CBDC” and “I am worried that my balance of CBDC can be misused by an unauthorized person.”

3.3.5.3 Financial Knowledge

Financial knowledge refers to the understanding level of users in money such as how it functions theoretically. This variable is measured by Wu et al. (2022). The example questions are “I think that I am familiar with finance related terms and concepts” and “I consider myself to be financially literate”.

3.3.5.4 Openness to Innovation

The meaning of openness to innovation is the level of willingness to accept new things. This variable is measured by Gupta et al. (2023a) and Wu et al. (2022). The example questions are “If I heard about CBDC, I would look for ways to experiment with it” and “Among my peers, I am usually the first to explore new technology i.e., Mobile / Internet Payment, Peer-peer Lending, etc.”

3.3.5.5 Regulatory Factor

The regulatory factor is the degree of management to protect CBDC usage. It can protect the data and privacy of the users in CBDC. This variable is measured by Gupta et al. (2023a). The example questions are “I am aware of the legal fraud existing in the use of CBDC” and “I am aware of the legal regulations governing the implementation of CBDC”.

3.3.5.6 Security Factor

Security factors refer to the trust of CBDC users towards the security of CBDC to protect the data of CBDC users and whether it can prevent fraud and hackers from getting involved in illegal activity. This variable is measured by Gupta et al. (2023b). The example questions are “I am worried that my personal information will be insecure when I use the CBDC” and “I am worried that I will forget my digital wallet password, so all the digital money within the wallet will be lost.”

3.3.6 Questionnaire Designing

There are three sections in the questionnaire. In section A, demographic data is collected in six questions which include gender and faculty which use nominal scale, as well as age group, mobile/Internet experience, and online payment experience which are measured in ordinal scale and year of study in interval scale.

In Section B, a total of 31 questions with the distribution of six, five, nine, five and six for independent variables which are the privacy factor, financial knowledge, openness to innovation, regulatory factor and security factor respectively. In addition, a 5-point Likert scale is used for the questions.

In Section C, 5 questions regarding the dependent variable which is willingness to adopt CBDC are asked. Similar to the previous section, the 5-point Likers scale is used for measurement.

3.4 Proposed Data Analysis Tool

This step aims to examine the hypotheses established (Sekaran & Bougie, 2016). Software Eviews 12 SV is used. Besides, SPSS 26.0 is used because Wu et al. (2022) applied it as well to perform various tests below.

3.4.1 Data Processing

Data processing is a process to convert raw data into useful information. It involves several steps including checking, editing, coding and tabulating (MBA Knowledge Base, n.d.). The purpose of performing data processing is data reduction by eliminating errors.

3.4.1.1 Data Checking

First, data checking is performed to detect the errors such as omission of data, so the data set is valid to be further processed. This step is to ensure consistency in the data by minimizing the mistakes, so accurate and reliable information is obtainable.

3.4.1.2 Data Editing

Second, data editing is to make corrections on the mistakes found in the previous step. For example, if there is missing data on some parts of a response, the whole response can be deleted because incomplete data will cause inconsistency and influence the data calculation. This step is to remove the unsatisfied answer which could decrease the accuracy of information.

3.4.1.3 Data Coding

Third, data coding is performed to quantify the raw data as qualitative data is used in this study. Numbers are assigned to each answer to make the data easy to process in the next step as shown below:

Section A

Table 3.2

Coding for Questionnaire Answers in Section A

No	Question	Coding for Answer
1	Gender	“Male” = 1 “Female” = 2
2	Age group	“Under 25” = 1 “25 and above” = 2
3	Faculty	“FAS” = 1 “FBF” = 2 “FEGT” = 3 “FICT” = 4 “FSc” = 5 “ICS” = 6
4	Year of study	“Year 1” = 1 “Year 2” = 2 “Year 3” = 3 “Year 4” = 4 “Year 5 and above” = 5
5	Mobile/ Internet Experience	“No experience” = 1 “0-2 years” = 2 “3-5 years” = 3 “5-10 years” = 4 “ten years and above” = 5
6	Online Payment Experience	“No experience” = 1

“0-2 years” = 2

“3-5 years” = 3

“5-10 years” = 4

“ten years and above” = 5

Section B & C

5-point Likert scale is used for coding in this session.

“Strongly Disagree (SD)” = 1

“Disagree (D)” = 2

“Neutral (N)” = 3

“Agree (A)” = 4

“Strongly Agree (SA)” = 5

3.4.1.4 Data Transcribing

Last, data transcribing is carried out to turn the raw data into useful information by inserting raw data into Eviews 12 SV and SPSS 26.0.

3.4.2 Descriptive Analysis

This analysis is to summarize the data and measure frequency, central tendency and variation (Kaur et al., 2018). In this study, frequency and percentage are calculated for data in Section A, while mean and standard deviation are analyzed for data in Sections B and C.

3.4.3 Scale Measurement

3.4.3.1 Reliability Test

The reliability test examines fitness for the study of the developed scale. Cronbach's alpha is widely used. The closer the value to one, the scale is more reliable (Sekaran & Bougie, 2010).

Table 3.3

Cronbach's Alpha Rule of Thumb

Cronbach's Coefficient Alpha (α)	Reliability
0.80 to 0.95	Very Good
0.70 to 0.80	Good
0.60 to 0.70	Fair
<0.60	Poor

Source: Sekaran & Bougie (2010)

Table 3.4

Results of Reliability Test for Pilot Test

Variables	Cronbach's alpha	Items
Privacy factor	0.851	6
Financial Knowledge	0.884	5
Openness to innovation	0.941	9
Regulatory factor	0.863	5
Security factor	0.888	6
Willingness to adopt CBDC	0.832	5

From table 3.4, it is noticed that all the Cronbach's alpha meet the statistical requirement which is more than 0.6. Therefore, scales for all variables are reliable in explaining our research.

3.4.4 Preliminary Data Screening

3.4.4.1 Multicollinearity

Multicollinearity means there is a correlation between the independent variables which will lead to higher error terms; hence, results become inaccurate. Multicollinearity occurs when the tolerance value below 0.1 as well as when VIF above 10 (Sekaran & Bougie, 2016).

3.4.4.2 Normality

A normality test is essential because many statistical approaches such as regression can only proceed provided that the observation follows normal distribution to obtain a precise result (Das, 2016). According to George and Mallery (2010), there is a normal distribution of data if the value for skewness and kurtosis is between -2 and +2. Hence, skewness and kurtosis for each variable will be calculated. Besides, the Jarque-Bera Test is also conducted. Jarque-Bera Test also computes skewness and kurtosis based on OLS residuals (Wooldridge, 2019). In this test, skewness should be below 1 while kurtosis should not be more than 3. In addition, the Jarque-Bera Test computes all the variables together instead of computing them

independently, and it will generate test statistics of Jarque-Bera with P-value which will determine the significance of the test to make decision on the null hypothesis of there is a normal distribution of data.

3.4.4.3 Heteroscedasticity

According to Wooldridge (2019), heteroscedasticity occurs when the error variance is not constant. This problem could happen due to human behavior, outliers, or misspecification. As a consequence, the variance of the estimators is no longer minimum. As a result of invalid standard errors, t statistics, and F statistics are not reliable, and the conclusion made is misleading. Several tests can be conducted to examine heteroscedasticity, but White test is easy to be used and it does not rely on normality distribution (Wooldridge, 2019). Therefore, White test is conducted in this study with the null hypothesis that all error variances are constant.

3.4.5 Inferential Analysis

This analysis is performed to estimate a parameter for independent variables from the sample to predict the dependent variable, the willingness to adopt CBDC of undergraduate students in UTAR.

3.4.5.1 Multiple Linear Regression Analysis

Taylor (2023) claimed that multiple linear regression analysis examine linear association between a regressand with more than 1 regressors. This

approach is applied in this study because there are five independent variables. Besides, it has been employed by Amarta and Latifah (2023) as well to examine the factors of use of CBDC.

This analysis provides information such as unstandardized beta coefficients which tell change in regressand for every movement of one unit in regressor, a p-value of t-stat which tells the important of the regressor, a p-value of F-test which tells the model significance and R-squared which tell the percentage of alteration in the regressand that can be explained by alteration in regressors (Bordens & Abbott, 2022). P-value below 0.1 represent item is significant.

Before performing regression analysis, the same category of variables questions are combined into a univariate variable. For example, six questions on privacy factor will be transformed into a single variable that is more reliable so the regression analysis can directly examine privacy factor. To compute this converted variable, the average value is taken because the number of questions for each type of variable is different.

The equation to be obtained:

$$WA_i = B_0 + B_1PF + B_2FK_i + B_3OI_i + B_4RF_i + B_5SF_i + \mu_i$$

Where WA_i = Willingness to adopt CBDC

PF_i = Privacy factor

FK_i = Financial knowledge

OI_i = Openness to innovation

RF_i = Regulatory factor

SF_i = Security factor

μ_i = Error term

This analysis will examine the extent of the effect of regressors on the right-hand side on the regressand on another side.

3.5 Conclusion

To conclude, this chapter details the way to conduct this study. This is quantitative research using a questionnaire distributed online in Google Forms to measure the agreement level to statements of each variable to examine the factor affecting willingness to adopt CBDC among 393 samples from undergraduate students in UTAR. After collecting the answers, data will be analyzed using Eviews 12 and SPSS 26.0 to produce the descriptive and inferential analysis results.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

First, descriptive analysis is carried out. Next, a reliability test is run to ensure dependability. Multicollinearity test, normality test and heteroscedasticity test are also examined as preliminary data screening. Then, multiple linear regression analysis is done. All tests are performed through SPSS 26.0 and Eviews 12 SV.

4.1 Descriptive Analysis

Descriptive analysis is performed to show the frequency and percentage of demographic data collected in section A of survey questionnaires, as well as mean and standard deviation of variables data gathered in section B and C.

4.1.1 Respondents' Demographic Profile

Six categories of demographic data are involved including gender, age group, faculty, year of study, mobile/Internet experience, and online payment experience.

4.1.1.1 Gender

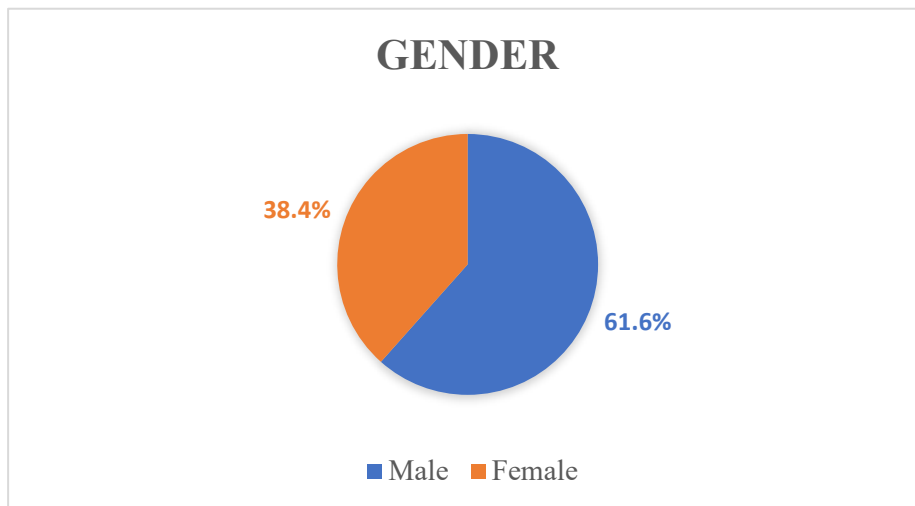
Table 4.1

Descriptive Analysis for Gender

Gender	Quantity	%	Accumulative Quantity	Accumulative Percentage (%)
Male	242	61.6	242	61.6
Female	151	38.4	393	100

Figure 4.1:

Descriptive Analysis for Gender



Respondents are grouped by gender. As shown above, there are 393 undergraduate students participated in the survey. 61.6% (242 respondents) are male while another 38.4% (151 respondents) are female. Thus, there are more male respondents than female respondents.

4.1.1.2 Age Group

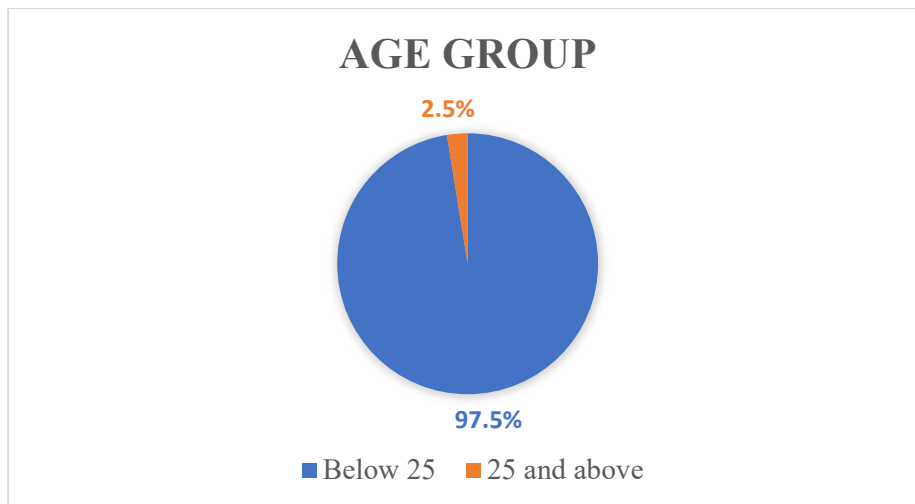
Table 4.2

Descriptive Analysis for Age Group

Age Group	Quantity	%	Accumulative Quantity	Accumulative Percentage (%)
Below 25	383	97.5	383	97.5
25 and above	10	2.5	393	100.0

Figure 4.2:

Descriptive Analysis for Age Group



Besides, participants are grouped by age group. As illustrated above, there are 97.5% (383 people) participants fall in the age group below 25, while the rest 2.5% (10 people) are 25 and above. Hence, the majority are below 25 years old.

4.1.1.3 Faculty

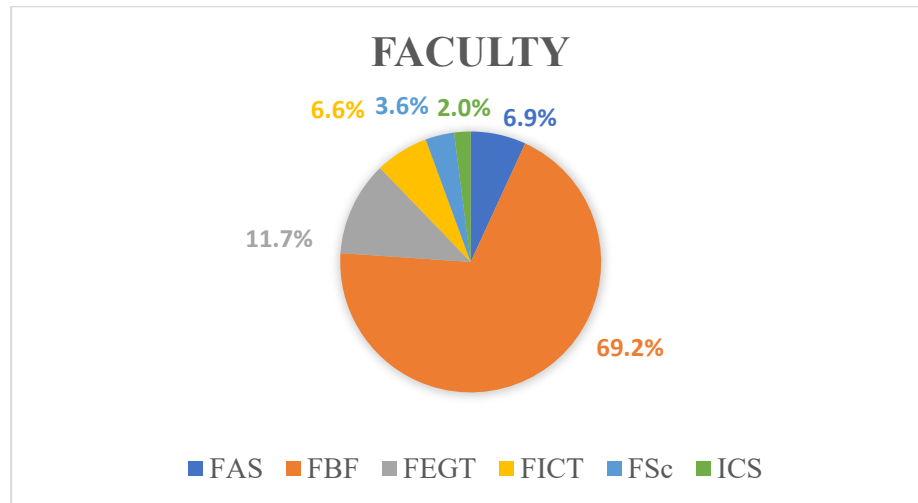
Table 4.3

Descriptive Analysis for Faculty

Faculty	Quantity	%	Accumulative Quantity	Accumulative Percentage (%)
FAS	27	6.9	27	6.9
FBF	272	69.2	299	76.1
FEGT	46	11.7	345	87.8
FICT	26	6.6	371	94.4
FSc	14	3.6	385	98.0
ICS	8	2.0	393	100.0

Figure 4.3:

Descriptive Analysis for Faculty



Next, data for faculty of target population is collected. As be revealed above, 69.2% (272 respondents) are from FBF, followed by 11.7% (46 respondents) from FEGT, 6.9% (27 respondents) from FAS, 6.6% (26 respondents) from FICT, and 3.6% (14 respondents) from FSc. The least participants are from ICS with only 2% (8 respondents).

4.1.1.4 Year of Study

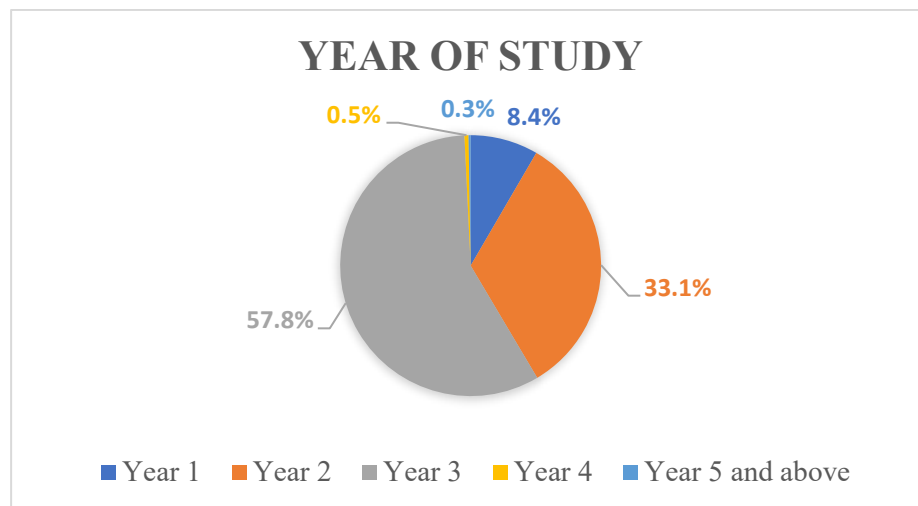
Table 4.4

Descriptive Analysis for Year of Study

Year of Study	Quantity	%	Accumulative Quantity	Accumulative Percentage (%)
Year 1	33	8.4	33	8.4
Year 2	130	33.1	163	41.5
Year 3	227	57.8	390	99.2
Year 4	2	0.5	392	99.7
Year 5 and above	1	0.3	393	100.0

Figure 4.4:

Descriptive Analysis for Year of Study.



Furthermore, students are required to answer their current study year. As can be seen, year 3 students are the most with 227 respondents (57.8%). Then, 33.1% (130 respondents) are from year 2. Next, 8.4% (33 respondents) from year 1, followed by 0.5% (2 respondents) from year 4. The least is year 5 and above students with 1 respondent.

4.1.1.5 Mobile / Internet Experience

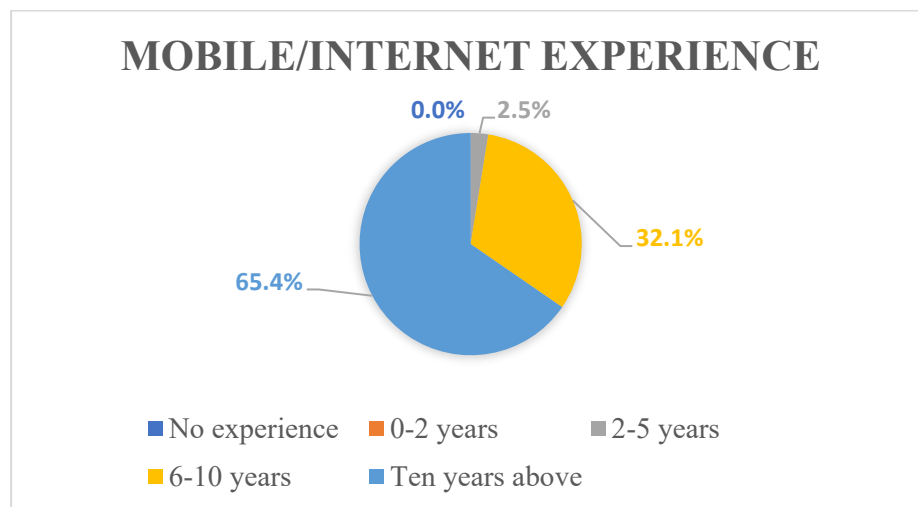
Table 4.5

Descriptive Analysis for Mobile / Internet Experience

Mobile / Internet Experience	Quantity	%	Accumulative Quantity	Accumulative Percentage (%)
No experience	0	0	0	0
0-2 years	0	0	0	0
2-5 years	10	2.5	10	2.5
6-10 years	126	32.1	136	34.6
Ten years above	257	65.4	393	100.0

Figure 4.5:

Descriptive Analysis for Mobile/Internet Experience



It is shown that no one has no experience and 0-2 years of experience. Then, 10 respondents (2.5%) have 2-5 years of experience and 126 respondents (32.1%) have 6-10 years of experience. Most of the students, 257 respondents have more than 10 years of experience in mobile/Internet experience.

4.1.1.6 Online Payment Experience

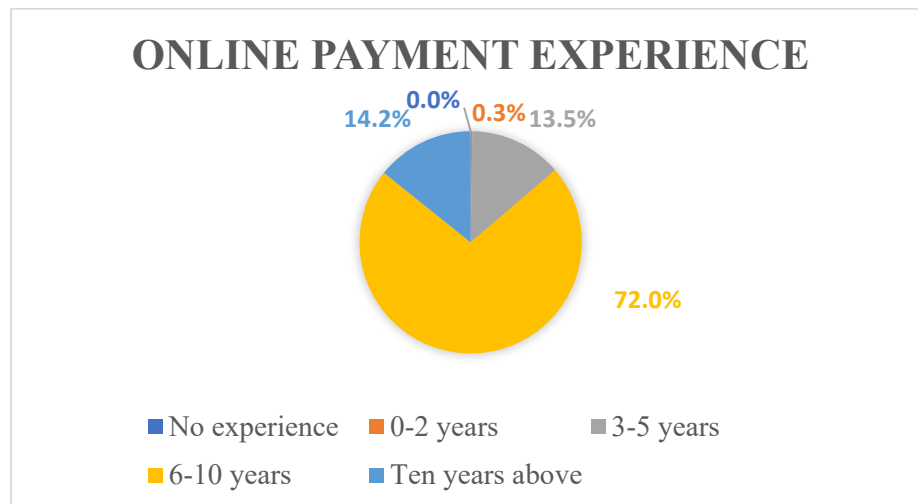
Table 4.6

Descriptive Analysis for Online Payment Experience

Online Payment Experience	Quantity	%	Accumulative Quantity	Accumulative Percentage (%)
No experience	1	0.3	1	0.3
0-2 years	53	13.5	54	13.7
2-5 years	283	72.0	337	85.8
6-10 years	56	14.2	393	100.0
Ten years above	0	0	393	100.0

Figure 4.6:

Descriptive Analysis for Online Payment Experience



Lastly, respondents are grouped by online payment experience. The majority amounted to 283 respondents (72%) have 3-5 years of experience. Next, 56 respondents (14.2%) have 6-10 years of experience, followed by 53 respondents (13.5%) who have 0-2 years of experience. Lastly, the least number of respondents has no experience at all because account for 0.3% only (1 respondent).

4.1.2 Central Tendencies and Dispersion Measurement of Constructs

This section calculates the mean and standard deviation of each question from each variable. The dependent variable has 5 questions while the five independent variables have 6, 5, 9, 5, and 6 questions respectively.

4.1.2.1 Willingness to Adopt CBDC

Table 4.7

Central Tendencies Measurement of Willingness to Adopt CBDC

Abbreviation for Query	Average Value	Std Dev	Average Value Position	Std Dev Position
WA1	3.6794	1.22016	2	4
WA2	3.7226	1.27652	1	3
WA3	3.5522	1.20287	3	5
WA4	2.2875	1.32144	4	1
WA5	2.2824	1.29525	5	2

First, questions related to willingness to adopt CBDC are analyzed. Table 4.7 shows that average value for WA2 of 3.7226 is the top, while average value for WA5 of 2.2824 is the bottom. Next, WA4’s standard deviation of 1.32144 is the largest while WA 3 has the smaller standard deviation.

4.1.2.2 Privacy Factor

Table 4.8

Central Tendencies Measurement of Privacy Factor

Abbreviation for Query	Average Value	Std Dev	Average Value Position	Std Dev Position
PF1	2.6794	1.22225	5	5
PF2	2.7888	1.23043	2	4
PF3	2.7125	1.20639	4	6
PF4	2.7277	1.26155	3	2
PF5	2.8855	1.25747	1	3
PF6	2.6743	1.26804	6	1

Next, six questions for privacy factor are examined. The highest mean of 2.8855 belongs to PF5, while PF6 has the smallest mean of 2.6743. At the same time, PF6's standard deviation of 1.26804 is the largest. Lastly, PF3's standard deviation of 1.20639 is the smallest.

4.1.2.3 Financial Knowledge

Table 4.9

Central Tendencies Measurement of Financial Knowledge

Abbreviation for Query	Average Value	Std Dev	Average Value Position	Std Dev Position
FK1	3.2519	1.25769	5	1
FK2	3.2595	1.20535	4	3

FK3	3.3028	1.20264	3	4
FK4	3.3639	1.19839	2	5
FK5	3.3995	1.21248	1	2

The third variable, financial knowledge has 5 questions. The question with the highest mean is FK5 with 3.3995, while the lowest mean belongs to FK1 with 3.2519. Standard deviation of FK1 is the largest with 1.25769 while FK4 is the smallest with the value of 1.19839.

4.1.2.4 Openness to Innovation

Table 4.10

Central Tendencies Measurement of Openness to Innovation

Abbreviation for Query	Average Value	Std Dev	Average Value Position	Std Dev Position
OI1	3.2774	1.29635	8	1
OI2	3.3613	1.17878	4	8
OI3	3.3511	1.14235	5	9
OI4	3.2799	1.21765	9	6
OI5	3.3130	1.22527	7	5
OI6	3.3511	1.26928	5	2
OI7	3.4402	1.20251	1	7
OI8	3.3817	1.26244	3	3
OI9	3.4173	1.23673	2	4

Openness to innovation has the most questions with a total of 9 questions. Among them, OI7 has the biggest average value of 3.4402, OI4 has the

smallest average value of 3.2799. Next, OI1’s standard deviation of 1.29635 is the largest while OI3’s standard deviation of 1.14235 is the smallest.

4.1.2.5 Regulatory Factor

Table 4.11

Central Tendencies Measurement of Regulatory Factor

Abbreviation for Query	Average Value	Std Dev	Average Value Position	Std Dev Position
RF1	3.2163	1.22539	5	3
RF2	3.2672	1.25656	4	1
RF3	3.3079	1.17775	3	5
RF4	3.3511	1.24902	2	2
RF5	3.3791	1.20639	1	4

Apart from that, 5 questions from regulatory factors are examined. As illustrated, the biggest average value belongs to RF5 with 3.3791 while RF1 has the smallest average of 3.2163. Furthermore, RF2 with largest standard deviation of 1.25656, while the smallest standard deviation of 1.17775 is possessed by RF3.

4.1.2.6 Security Factor

Table 4.12

Central Tendencies Measurement of Security Factor

Abbreviation for Query	Average Value	Std Dev	Average Value Position	Std Dev Position
SF1	3.2926	1.34140	3	1
SF2	3.3232	1.26164	1	3
SF3	3.1476	1.23866	6	5
SF4	3.2926	1.19667	3	6
SF5	3.2850	1.23932	5	4
SF6	3.3028	1.28071	2	2

The last variable that has been analyzed is security factor. Among the six questions, SF2 has the highest mean of 3.3232, while SF3 has the lowest mean of 3.1476. Furthermore, SF1 has the largest standard deviation of 1.34140 while SF4 has the smaller standard deviation of 1.19667.

4.2 Scale Measurement

4.2.1 Reliability Test

Table 4.13

Cronbach's Alpha Reliability Analysis

Variable	Quantity of items	Cronbach's Alpha	Grade
Willingness to Adopt CBDC	5	0.789	Good
Privacy Factor	6	0.719	Good
Financial Knowledge	5	0.709	Good
Openness to Innovation	9	0.829	Very Good
Regulatory Factor	5	0.702	Good
Security Factor	6	0.759	Good

From Table 4.13, the scales for all variables are found to be reliable. The dependent variable has good reliability with Cronbach's alpha more than 0.7 and below 0.8. Similarly, four independent variables which are privacy factor, financial knowledge, regulatory factor, and security factor with Cronbach's alpha of 0.719, 0.709, 0.702, and 0.759 respectively have good reliability. Next, one of the independent variables which is openness to innovation has Cronbach's alpha of 0.829, indicating a very good reliability because it falls in the range between 0.8 and 0.95. This is most likely because it has the most items of 9 questions in total. Hence, all items are kept in the study.

4.3 Preliminary Data Screening

Before inferential, result can only be trusted without any issue if data pass three tests regarding multicollinearity, normality, and heteroscedasticity.

4.3.1 Multicollinearity Test

Multicollinearity means there is a correlation between the independent variables which will lead to higher error terms; hence, results become inaccurate. Tolerance value is used to detect this problem. Multicollinearity occurs when the value is lower than 0.1. Besides, variance inflation factor (VIF) above 10 also indicated issue occurs (Sekaran & Bougie, 2016).

Table 4.14

Tolerance and Variance Inflation Factor (VIF)

Independent Variables	Tolerance	VIF
Privacy Factor	0.593	1.687
Financial Knowledge	0.403	2.479
Openness to Innovation	0.318	3.142
Regulatory Factor	0.394	2.540
Security Factor	0.392	2.553

Table 4.14 indicates all the independent variables have tolerances of more than 0.1 and VIF values of less than 10. Hence, the multicollinearity issue does not exist.

4.3.2 Normality Test

To examine whether the data is normally distributed, four methods are employed, including skewness and kurtosis values, histogram, a normal Q-Q plot, and Jarque-Bera Test.

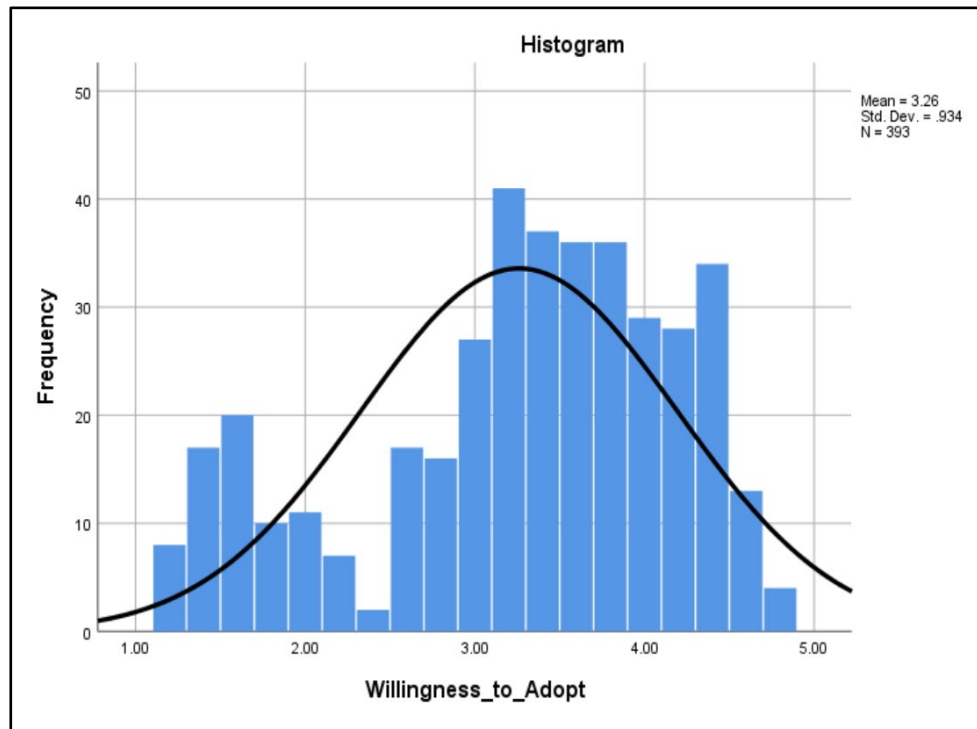
Table 4.15

Normality Test Result

Variables	Skewness	Kurtosis
Willingness to Adopt CBDC	-0.636	-0.493
Privacy Factor	0.589	-0.545
Financial Knowledge	-0.530	-0.548
Openness to Innovation	-0.817	-0.312
Regulatory Factor	-0.583	-0.497
Security Factor	-0.598	-0.664

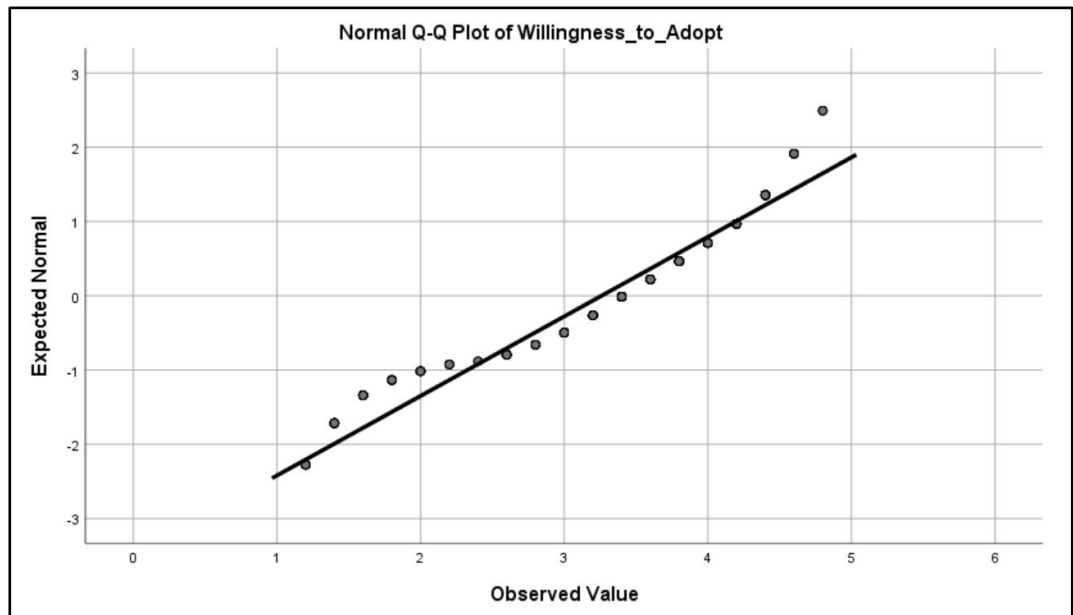
The highest skewness value is 0.589 in privacy factor and the lowest skewness value is -0.817 in openness to innovation. On the other hand, the highest kurtosis value is -0.312 in openness to innovation and the lowest kurtosis value is -0.664 in security factor. Since all results are within acceptable range, there is a normal distribution.

Figure 4.7:

Histogram of normality for dependent variables

According to Mishra et al. (2019), histogram can tell the normality especially when the sample size is more than 300. The histogram can estimate the normal probability distribution provided that the graph is approximately bell-shaped. Figure 4.7 shows a histogram created based on the dependent variable with a distribution plot like bell-shape as the highest frequency is in the middle and the low frequency on 2 sides. Hence, there is a normal distribution.

Figure 4.8:

Normal Q-Q plot

A normal Q-Q plot measure normality distribution. It is a scatterplot generated using two sets of quantiles which are the expected value and observed value. When both are approximately equal, then the data is normally distributed (Mishra et al., 2019). Figure 4.8 shows that the plots (observed values) are scattered around the straight line, representing the data has a normal distribution.

Figure 4.9:

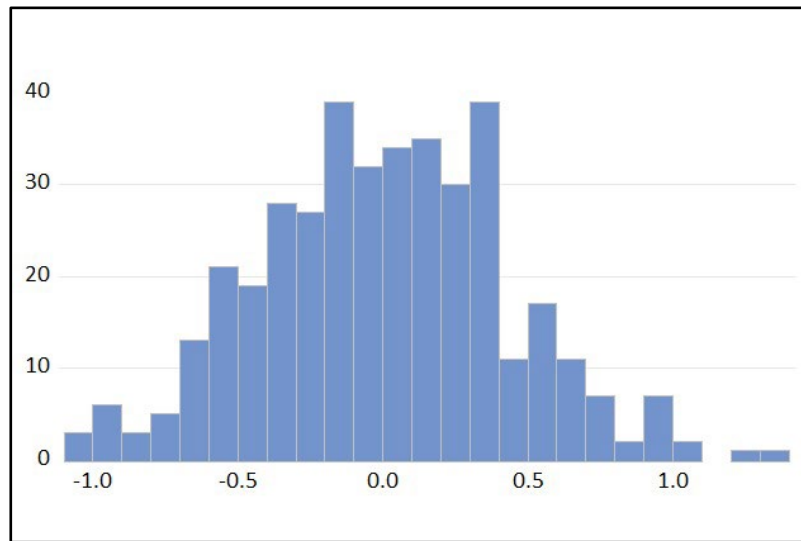
Histogram of Jarque-Bera Test

Table 4.16

Jarque-Bera Test Result

Skewness	0.1050
Kurtosis	2.9398
Jarque-Bera	0.7824
Probability	0.6762

Figure 4.9 shows a bell-shaped curve of residual distribution. Meanwhile, table 4.16 indicates the result of the Jarque-Bera Test that is within the acceptable range which is skewness lower than 1 and kurtosis below 3. Besides, the P-value of Jarque-Bera is 0.6762 is more than 0.1, so we don't reject the null hypothesis. Thus, a conclusion that can be made is there is a normal distribution.

4.3.3 Heteroscedasticity

Table 4.17

White Test Result

Obs*R-squared	23.59417
Prob. Chi-Square(20)	0.2606

The null hypothesis is all error variances are constant while the alternative hypothesis is at least one of the error variances is not constant. With a significance level of 0.1, the null hypothesis is rejected if the P-value is less than 0.1. However, the result of the P-value generated from the White Test is 0.2606 which is more than the significance level. Hence, the null hypothesis is not rejected. Therefore, the conclusion made is all the error variances are constant and there is no heteroscedasticity problem.

4.4 Inferential Analysis

4.4.1 Multiple Linear Regression Analysis

Table 4.18

Multiple Linear Regression Analysis

	Unstandardized Coefficient Beta	Coefficient Std. Error	Standardized Coefficient Beta	t- statistics	P-value
(Constant)	-.362	.122		-2.597	.003
PF	.141	.042	.121	3.375	.001
FK	.178	.049	.158	3.625	.000

OI	.338	.057	.288	5.877	.000
RF	.250	.050	.221	5.014	.000
SC	.210	.049	.191	4.315	.000
R-squared					.704
Adjusted R-square					.700
F-test					184.149
P-value					.000

In this study, multiple linear regression analysis is utilized as inferential analysis to examine association between regressors which are privacy factor (PF), financial knowledge (FK), openness to innovation (OI), regulatory factor (RF) and security factor (SF) and the regressand, desire to use CBDC. Table 4.16 indicates the results obtained which include unstandardized coefficient beta that represents the slope between regressors and regressand. Then, standardized coefficient beta measure the strength of each regressor to regressand (Statistics How To, 2024), t-statistics with its p-value to measure the significance level, R-squared and adjusted R-square, as well as F-test with its p-value.

The first independent is privacy factor. The p-value of t-test below 0.01 indicates a significant result at 99% confidence level. The positive unstandardized coefficient beta is matched with previous study by Gupta et al. (2023b). Furthermore, the unstandardized coefficient value is 0.141, indicating a unit increase in privacy factor, on average, the willingness to adopt CBDC increases by 0.141 unit, *ceteris paribus*. Next, it has the lowest standardized coefficient beta, indicating the weakest effect on willingness to adopt CBDC. For every one unit increase of standard deviation in privacy factor, on average, the standard deviation in willingness to adopt CBDC increases by 0.121, *ceteris paribus*.

The second independent is financial knowledge. The p-value of t-test below 0.01 indicates a significant result at 99% confidence level. The positive unstandardized coefficient beta is matched with previous study by Amarta and Latifah (2023). Furthermore, the unstandardized coefficient value is 0.178, indicating a unit increase in financial knowledge , on average, the willingness to adopt CBDC increases by 0.178 unit, *ceteris paribus*. Next, it has the fourth highest standardized coefficient beta, indicating the fourth strongest effect on willingness to adopt CBDC. For every one unit increase of standard deviation in financial knowledge, on average, the standard deviation in willingness to adopt CBDC increases by 0.158, *ceteris paribus*.

The third independent is openness to innovation. The p-value of t-test below 0.01 indicates a significant result at 99% confidence level. The positive unstandardized coefficient beta is matched with previous study by Gupta et al. (2023a), Wu et al. (2022), and Kim et al. (2022). Furthermore, the unstandardized coefficient value is 0.338, indicating a unit increase in openness to innovation , on average, the willingness to adopt CBDC increases by 0.338 unit, *ceteris paribus*. Next, it has the highest standardized coefficient beta, indicating the strongest effect on willingness to adopt CBDC. For every one unit increase of standard deviation in openness to innovation, on average, the standard deviation in willingness to adopt CBDC increases by 0.288, *ceteris paribus*.

The fourth independent is regulatory factor. The p-value of t-test below 0.01 indicates a significant result at 99% confidence level. The positive unstandardized coefficient beta is matched with previous study by Cheng (2022). Furthermore, the unstandardized coefficient value is 0.25, indicating a unit increase in regulatory factor, on average, the willingness to adopt CBDC increases by 0.25 unit, *ceteris paribus*. Next, it has the second highest standardized coefficient beta, indicating the second strongest effect on willingness to adopt CBDC. For every one unit increase of standard

deviation in regulatory factor, on average, the standard deviation in willingness to adopt CBDC increases by 0.221, *ceteris paribus*.

The fifth independent is security factor. The p-value of t-test below 0.01 indicates a significant result at 99% confidence level. The positive unstandardized coefficient beta is matched with previous study by Nocon (2023) and Gupta et al. (2023b). Furthermore, the unstandardized coefficient value is 0.21, indicating a unit increase in security factor, on average, the willingness to adopt CBDC increases by 0.21 unit, *ceteris paribus*. Next, it has the third highest standardized coefficient beta, indicating the third strongest effect on willingness to adopt CBDC. For every one unit increase of standard deviation in security factor, on average, the standard deviation in willingness to adopt CBDC increases by 0.191, *ceteris paribus*.

Besides, r-squared measure percentage change in regressand that can be influenced by the percentage change in regressors. The result of 0.704 means that 70.4% of the variation in willingness to adopt CBDC can be explained by the variation in privacy factor, financial knowledge, openness to innovation, regulatory factor and security factor as a whole.

Next, the adjusted r-square is calculated after considering the degree of freedom. Hence, the value 0.700 means that 70% of the variation in willingness to adopt CBDC can be explained by the combined variation in privacy factor, financial knowledge, openness to innovation, regulatory factor and security factor, after taking into account degree of freedom.

Lastly, F-test is to measure the overall significance of the model. The regression model is significant at 99% because its p-value is below 0.01.

Thus, a significant relationship is proven between the combined five independent variables which are privacy factor (PF), financial knowledge (FK), openness to innovation (OI), regulatory factor (RF) and security factor (SF) and the dependent variable, which is the willingness to adopt CBDC.

4.5 Conclusion

Eviews 12 and SPSS 26.0 are utilized to perform analysis. It summarized the data obtained. It is found that the questionnaires' scales are reliable. Next, multicollinearity issue does not exist, the data is normally distributed, and there is no heteroscedasticity problem. Lastly, the whole model is significant as all independent variables which are privacy factor, financial knowledge, openness to innovation, regulatory factor, and security factor are positively and significantly related to the willingness to adopt CBDC.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

Results from previous section are further discussed in this segment. First part tabulate results of inferential analysis. Then, rationales of results are discussed. Next, recommendations for applications are given. Last part elaborated constraints detected and suggestion for future research.

5.1 Discussion and Major Findings

5.1.1 Key factor of willingness to adopt CBDC among Undergraduate Student in UTAR.

Table 5.1

Summary of the Statistic Findings

Predictor Variable	T-statistic	P-value	Results
Privacy factor	3.375	0.001	Significant
Financial knowledge	3.625	0.000	Significant
Openness to innovation	5.877	0.000	Significant
Regulatory factor	5.014	0.000	Significant
Security factor	4.315	0.000	Significant

According to Table 5.1, privacy factor, financial knowledge, openness to innovation, regulatory factor, and security factor are significantly associated with the willingness to adopt CBDC. So, all the independent variables have a solid predictor of the willingness to adopt CBDC.

5.1.1.1 Privacy Factor

The result mentioned that the privacy factor is significantly associated with the willingness to adopt CBDC. The result of privacy factor positively influences willingness to adopt CBDC is same as study by Gupta et al. (2023b). Undergraduate students who worried about their privacy will not utilize CBDC because they fear that someone else will steal their transaction and financial information.

5.1.1.2 Financial Knowledge

The result mentioned that the influence of financial knowledge has been confirmed to affect the willingness to adopt CBDC. The result of financial knowledge positively influences willingness to adopt CBDC is same as study by Amarta and Latifah (2023). Students have the greatest potential to influence the willingness to adopt the CBDC since financial knowledge increases their ability to assess and judge things after they have gained more relevant information.

5.1.1.3 Openness to Innovation

The result mentioned that openness to innovation has a significant influence on the willingness to adopt CBDC. The openness to innovation has a positive relationship with willingness to adopt CBDC which matched the study by Wu et al. (2022) and Kim et al. (2022). Due to their greater openness, desire, and understanding to embrace newly introduced technology, undergraduate students who are very receptive to innovation are more likely to use CBDC.

5.1.1.4 Regulatory Factor

The result mentioned that the regulatory factor has a significant influence on the willingness to adopt CBDC. The regulatory factor has a positive relationship with willingness to adopt CBDC which matched the study by Cheng (2022). Therefore, well-developed and highly transparent regulatory systems positively influence the willingness to adopt the CBDC among undergraduate students.

5.1.1.5 Security Factor

The result mentioned that the security factor has a significant influence on the willingness to adopt CBDC. The security factor has a positive relationship with willingness to adopt CBDC which matched the study by Nocon (2023) and Gupta et al. (2023b). Hence, undergraduate students are more willing to adopt CBDC if the safety of their money is guaranteed.

5.2 Implication of Study

5.2.1 Theoretical Implications

Previous study showed that Extended Attitude Formation Theory can explain how the privacy factor is correlated with the willingness to adopt CBDC. The influence relationship is due to the judgment and critical thinking made by users/individuals. As many countries in the world have not yet launched their CBDC to the public, citizens or potential users might criticize the effectiveness and completeness of CBDC. Besides, excessive CBDC design differences in privacy protection whether it should be semi-anonymity or fully transparent lead to users' distrust of its privacy protection, which indirectly leads to the decline of adoption (Tronnier et al., 2023) (Silva, 2022). In conclusion, these findings provide the direction for future research by implementing the Extended Attitude Formation Theory suggesting that privacy is considered as an important factor to influence an individual willingness to adopt new technology.

Based on previous research, Azjen's Theory of Planned Behavior can describe the association between financial knowledge and the desire to use CBDC. Xiao et al. (2011) who proved the theory suggest that higher financial knowledge leads individuals to have better financial attitudes and financial controllability, especially for the young adult population. A better financial attitude able to be reflected in the individual in three forms which are their spending, credit, and savings tend to be good in behavior. In the context of CBDC, the theory suggests that providing attention to financial education and interventions related to CBDC will enhance financial knowledge, especially for teenagers leading to improved development and adoption of CBDC (She et al., 2023). By utilizing Azjen's Theory of Planned Behavior, future researchers are able to implement such theory to investigate how financial knowledge influences the financial attitude toward

fintech product which includes cryptocurrencies, CBDC, digital payment system, credit cards, etc. (Gupta et al., 2023b; Norisnita & Indriati, 2022; Xiao et al., 2011). In conclusion, these findings provide the direction for future research by implementing Azjen's Theory of Planned Behavior and suggest that financial knowledge is considered as an important factor to influence an individual willingness to adopt new technology.

Based on previous research, Hofstede's Cultural Dimension Theory mentioned the association between openness to innovation and the willingness to adopt CBDC. According to this theory, openness to innovation is highly affected by the culture and experience of an individual. It is mentioned that cultural behavior has been planted inside an individual's personality and it is difficult to change cultural behavior while making innovative decisions (Kaasa & Vadi, 2008). In the context of CBDC, if a person already built up a habit of using physical cash notes to make transactions and never engaged in electronic payments, it is difficult to switch their cultural behavior to use CBDC as a medium of transaction in the future that match with the uncertainty avoidance, one of the dimensions of the theory (Hofstede, 1980). The theory suggests switching one-person cultural behavior to innovative, social media plays an important to widely motivating innovative behavior of its nature of worldwide access (Lo et al., 2017). In conclusion, these findings provide the direction for future research by implementing Hofstede's Cultural Dimension Theory suggesting that openness to innovation is considered as an important factor to influence an individual willingness in trying new technology.

Previous research also showed that UTAUT can explain the relationship between the regulatory factor, security factor, and the willingness to adopt CBDC. The theory investigates how an individual, businesses, and governments are willing to adopt new technology in their life. UTAUT implies willingness to adopt CBDC of an individual rely on the design of

CBDC to make their life better, easier, important, and such a product requires a huge organization or institution to support it (Venkatesh et al., 2016). In terms of regulatory factor, it is suggested that high quality and high transparency of regulatory frameworks are able to increase the willingness to adopt CBDC for an individual (Cheng, 2022). The theory suggests that the regulation design should be able to provide the benefits of securing its users. Regulation that secures the CBDC users highly increases the attractiveness of CBDC adoption in the future (Gupta et al., 2023a). In terms of security factor, the theory suggests that the CBDC design could be backed up with blockchain technology to reduce the cybersecurity risk and secure privacy data that is able to fulfill the components of the theory which is the social influence that explains how individual realizes the importance of this new technology when he or she starts to use it. In conclusion, these findings provide the direction for future research by implementing UTAUT suggesting that regulatory factors and security factors are considered important factors to influence an individual willingness to adopt new technology (Abass, 2022).

5.2.2 Practical Implications

Our research found that the privacy factor is significant and positively influences the willingness to adopt CBDC. This shows that UTAR students are more likely to have higher privacy while using the central bank's digital currency. Data privacy plays an important role in switching a country's monetary system from physical cash note payments to digital currency payments. From the student perspective, higher privacy is defined as the transaction information is not leaked while using CBDC to purchase goods and services. It is suggested that every transaction using CBDC requires face recognition or fingerprint confirmation before a successful transfer.

Financial knowledge is shown to be positively affecting willingness to adopt CBDC. This shows that UTAR students who have higher financial knowledge are more willing to adopt CBDC. Based on the student's perspective, financial knowledge can help an individual succeed in making daily financial decisions. It is suggested that parents could provide freedom and independence to their children in controlling their finances to improve their positive financial attitude. Besides, students perceived that financial knowledge was described as an individual's financial literacy. It is suggested that the academic institution should provide financial education to the public as soon as possible. Educational programs related to the fundamentals of digital banking and digital currency operation could be carried out for CBDC users such as students in the future (Horvath, 2023).

Openness to innovation is proven to be significantly and positively correlated with the desire to use CBDC. This shows that UTAR students who have a higher openness to innovation are more willing to adopt CBDC. Based on students' perspective, higher openness to innovation leads them to have an open mindset to try new things and new technologies. It is suggested that parents, schools, and the working environment provide opportunities to let students engage in new technologies and implement them in daily life. Besides, students perceived that openness to innovation could be practiced by experimenting the new technology. It is suggested that academic institutions and financial institutions to implement a CBDC pilot program for students to provide the opportunity for student's hands-on experience of using CBDC (Faykiss et al., 2022).

Besides, our research also found that the regulatory factor is significant and positively influences the willingness to adopt CBDC among undergraduate students in UTAR. This shows that UTAR students prefer to have more regulation while using the CBDC. Based on the student perspective, students are worried about the legal uncertainty that exists in the use of

CBDC. It is suggested that a constant and complete legal framework must be confirmed before the launch of CBDC. Besides, students believe that the government should have policies to promote the use of CBDC. Therefore, it is suggested that the government should always increase legal awareness about digital currency and provide relevant laws that are able to protect CBDC users' personal data and privacy information.

Lastly, our research also found that the security factor is significant and positively influences the willingness to adopt CBDC. This shows that UTAR students are more likely to have more security while using the central bank's digital currency. Based on the students' perspective, they believed that their balance of CBDC would not be misused by an unauthorized person. It is suggested that every single transaction using CBDC should proceed by face recognition or fingerprint confirmation. Besides, students believe that their transaction information will be recorded, and their payment process will not easily get interrupted. It is suggested that stable internet connections can confirm the payment process and the payment history should be live recorded in the system.

5.3 Limitation of Study

This section identified some research limitations. First of all, the majority survey's respondents are Chinese students in UTAR. There is a low number of other races to fill up the survey form such as Indian or Malay students in UTAR. So, the data result may be different with other universities that have various races because different ethics have their practices such as Malays have to adhere to Islamic principles in Malaysia.

Second, this study is conducted at UTAR, a private university in Malaysia. Perspectives from undergraduate students in public universities could have different results because of different emphases, practices, syllabus, and backgrounds. Hence, it could lead to a difference in willingness to adopt CBDC.

Third, this research used a qualitative method to collect the data on the questionnaire to explain the association between regressors and regressand. Questionnaire adopt tried-and-true method to gather response (Bird, 2009). Therefore, a large amount of data can be collected under this research method more effectively and cheaply. However, it is hard to get the real thoughts from the respondents under this survey questionnaire.

5.4 Recommendation for Future Study

Under this research topic, some of the future studies can be enhanced and be more comprehensive in the study about the factors affecting the willingness to adopt CBDC. So, these are the recommendations for future studies.

First, the researcher can select the respondents more widely such as Chinese, Indian, Malay, and so on. The survey data can be more identified compared to data collected from only one race about the willingness to adopt CBDC.

Second, the researcher can conduct a study to collect undergraduate student data from other public or private universities in Malaysia. They can do the combination data instead of using one university data. This will enhance the accuracy of the survey data and results as well.

Third, future researchers can use the qualitative method in their research. They can create a physical interview to collect more data to increase the potential and authenticity of their research result. Besides that, future researchers can also combine the quantitative and qualitative methods to understand more about the thoughts of the respondents.

5.5 Conclusion

This paper analyzes the components affecting the willingness to adopt CBDC among UTAR's undergraduate students. The survey forms were given to undergraduate students and the data received was inserted into Eviews 12 and SPSS 26.0 to analyze the result. Then, the analysis result showed that all the hypothesis which are H1 to H5 are being accepted. That means the privacy factor, financial knowledge, openness to innovation, regulatory factor and security factor have significant influences on the willingness to adopt CBDC. The findings discussion and implications have been provided in the content. Moreover, this study offered discussion and suggestions for future researchers as well. Therefore, the future researcher can refer to and use the data collection method, selection of independent variables, and the respondents in this study.

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APPENDICES

Appendix 1.1 Ethical Approval for Research Project


UNIVERSITI TUNKU ABDUL RAHMAN

DU012(A)

Wholly owned by UTAR Education Foundation

Co. No. 578227-M

Re: U/SERC/270/2023

17 October 2023

Ms Thavamalar a/p Ganapathy
 Head, Department of Economics
 Faculty of Business and Finance
 Universiti Tunku Abdul Rahman
 Jalan Universiti, Bandar Baru Barat
 31900 Kampar, Perak.

Dear Ms Thavamalar,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your students' research project from Bachelor of Economics (Honours) Financial Economics programme enrolled in course UBEZ3026. We are pleased to inform you that the application has been approved under Expedited Review.

The details of the research projects are as follows:

No.	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	Determinants of Financial Stress Among Undergraduates: A Case Study in Universiti Tunku Abdul Rahman	1. Lee Chi Ern 2. Yeoh Yew Wei 3. Wang Jhor Dhern	Dr Foo Chuan Chew	17 October 2023 – 16 October 2024
2.	Factors that Influencing the Saving Behaviors Among Undergraduate Students in Universiti Tunku Abdul Rahman (UTAR), Kampar	1. Ivy Koh Yi Hui 2. Lau Sin Ye 3. Leo Jie Yi	Mr Kuar Lok Sin	
3.	Factors Affecting the Willingness to Adopt Central Bank Digital Currency (CBDC) Among Undergraduate Students in UTAR	1. Chee Shag Yi 2. Kong Kah Kit 3. Ng Zhe Khai	Ms Kalai Vani a/p Kalimuthu	
4.	Fintech Adoption Among Generation Z in Malaysia	1. Chan Jian You 2. Chin Chen Hun 3. Koo How Shen		
5.	Drivers of Environmental Sustainability Practices Among Undergraduate Students in UTAR	1. Lim Tian He 2. Tan Kian Yew	Dr Teoh Sok Yee	

The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.
- (4) Written consent be obtained from the institution(s)/company(ies) in which the physical or/and online survey will be carried out, prior to the commencement of the research.

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
 Tel: (605) 468 8888 Fax: (605) 466 1313
 Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
 Tel: (603) 9086 0288 Fax: (603) 9019 8868
 Website: www.utar.edu.my



Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,



Professor Ts Dr Faiz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Business and Finance
 Director, Institute of Postgraduate Studies and Research

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 Fax: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 Fax: (603) 9019 8868
Website: www.utar.edu.my



Appendix 1.2 Survey Questionnaire



UNIVERSITI TUNKU ABDUL RAHMAN
BACHELOR OF ECONOMICS (HONS) FINANCIALECONOMICS
FACULTY OF BUSINESS AND FINANCE
FACTORS AFFECTING THE WILLINGNESS
TO ADOPT CENTRAL BANK DIGITAL CURRENCY
(CBDC) AMONG UNDERGRADUATE STUDENTS
IN UTAR

Dear respondents,

We are undergraduate students of Bachelor of Economics (Honours) Financial Economics from Universiti Tunku Abdul Rahman (UTAR). We are currently conducting our final-year project (FYP). We hope that you can make us a favour to fill up our questionnaire.

The questionnaire consists of three sections. In Section 1, we would like to collect the respondents' demographic information. In Sections 2 and 3, we would like to collect the respondents' preferences related to the factors affecting the adoption of central bank digital currency (CBDC) among undergraduate students in UTAR. This study may take about 5-10 minutes.

Factors affecting the adoption of central bank digital currency (CBDC) that we observed include privacy factor, financial knowledge, openness to innovation, regulatory factor, and security factor. Our objective is to reveal the factors that influence the adoption of central bank digital currency (CBDC) Among undergraduate students in UTAR.

Your responses will be kept **PRIVATE and CONFIDENTIAL** and used solely for academic study and purpose. Thank you for your cooperation.

Thank you.

PERSONAL DATA PROTECTION STATEMENT

Please be informed that in accordance with Personal Data Protection Act 2010 (“PDPA”) which came into force on 15 November 2013, Universiti Tunku Abdul Rahman (“UTAR”) is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

Notice:

1. The purposes for which your personal data may be used are inclusive but not limited to:-
 - For assessment of any application to UTAR
 - For processing any benefits and services
 - For communication purposes
 - For advertorial and news
 - For general administration and record purposes
 - For enhancing the value of education
 - For educational and related purposes consequential to UTAR
 - For the purpose of our corporate governance
 - For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/ study loan

2. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

3. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

4. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

1. By submitting this form you hereby authorise and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purpose.

2. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.

3. You may access and update your personal data by writing to us at _____.

Acknowledgment of Notice

- I have been notified by you and that I hereby understood, consented and agreed per UTAR above notice.
- I disagree, my personal data will not be processed.

.....

Name:

Date:

Section A: Demographic Information

In order to properly evaluate your intention to adopt CBDC, we would like to know a few things about you personally. Please mark (/) just ONE response per question.

1. Your Gender

Male () Female ()

2. Your Age Group

Below 25 () 25 and above ()

3. Faculty

FAS () FBF () FEGT () FICT ()
FSc () ICS ()

4. Year of Study

Year 1 () Year 2 () Year 3 () Year 4 ()
Year 5 and above ()

5. Mobile/ Internet Experience

No experience () 0-2 years () 3-5 years ()
6-10 years () Ten years above ()

6. Online Payment Experience

No experience () 0-2 years () 3-5 years ()
6-10 years () Ten years above ()

Section B: Factors affecting willingness to adopt CBDC

This section would like to hear your thoughts on the factors that influence willingness to adopt CBDC. Please indicate your level of agreement or disagreement with each of the following statements. Please circle the best option for each statement.

Privacy Factor

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) I am concerned that information on my purchasing behavior could be used in a way I did not foresee when using CBDC.	1	2	3	4	5
2) I am concerned that personal information relating to my identity could be used in a way I did not foresee when using CBDC.	1	2	3	4	5
3) I am concerned that unknown organizations or individuals can access my information when paying with CBDC.	1	2	3	4	5

4) I am concerned about paying with CBDC because of what others might do with my information.	1	2	3	4	5
5) To what extent is anonymity important in the adoption of a CBDC.	1	2	3	4	5
6) To what extent is privacy important in the adoption of a CBDC.	1	2	3	4	5

Financial Knowledge

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) I think that I am familiar with finance related terms and concepts.	1	2	3	4	5
2) I consider myself to be financially literate.	1	2	3	4	5
3) I consider my knowledge of finance to be sufficient.	1	2	3	4	5

4) I can make informed judgements of financial products or services.	1	2	3	4	5
5) I have the ability to apply basic knowledge in everyday financial choices.	1	2	3	4	5

Openness to Innovation

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) If I heard about CBDC, I would look for ways to experiment with it.	1	2	3	4	5
2) Among my peers, I am usually the first to explore new technology, i.e., Mobile/Internet Payment, Peer-Peer Lending etc.	1	2	3	4	5
3) I like to experiment with new technology, i.e., Mobile/Internet Payment, Peer-Peer Lending etc.	1	2	3	4	5

4) In general, I am not hesitant to try out new information technologies.	1	2	3	4	5
5) I think that I am not against innovations.	1	2	3	4	5
6) I think that I am interested in innovative technologies.	1	2	3	4	5
7) I think that I am open-minded to try new things.	1	2	3	4	5
8) I think that I have the courage to envision new possibilities.	1	2	3	4	5
9) I think that I am receptive to new information.	1	2	3	4	5

Regulatory Factor

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) I am aware of the legal fraud existing in the use of CBDC.	1	2	3	4	5
2) I am aware of the legal regulations governing the implementation of CBDC.	1	2	3	4	5

3) I am worried about the regulatory uncertainty that central bank digital currency carries.	1	2	3	4	5
4) I think the government has policies to promote the use of CBDC.	1	2	3	4	5
5) Overall, I think the government has a favorable legislation to use CBDC.	1	2	3	4	5

Security Factor

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) I am worried that my personal information will be insecure when I use the CBDC.	1	2	3	4	5
2) I am worried that my balance of CBDC can be misused by an unauthorized person	1	2	3	4	5

<p>3) I am worried that I will forget my digital wallet password, so all the digital money within the wallet will be lost.</p>	1	2	3	4	5
<p>4) I believed that CBDC has a secure web for electronics transactions.</p>	1	2	3	4	5
<p>5) I consider that CBDC guarantees that my payment process is not interrupted, and my transaction information is not lost.</p>	1	2	3	4	5
<p>6) I consider that online bank keep and handle my personal information safety.</p>	1	2	3	4	5

Section C: Willingness to adopt CBDC

	Strongly Agree	Disagree	Neutral	Agree	Strongly Agree
1) I will use CBDC if given the opportunity to do so.	1	2	3	4	5
2) I will use digital currency on a regular basis in future.	1	2	3	4	5
3) I have no objection to use CBDC for transactions.	1	2	3	4	5
4) I intend to use CBDC frequently for payments.	1	2	3	4	5
5) I would recommend my friends to use CBDC.	1	2	3	4	5

Appendix 1.3: Descriptive Analysis for Demographic Data

Gender

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	242	61.6	61.6	61.6
	Female	151	38.4	38.4	100.0
	Total	393	100.0	100.0	

Age Group

		Age_Group			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 25	383	97.5	97.5	97.5
	25 and above	10	2.5	2.5	100.0
	Total	393	100.0	100.0	

Faculty

		Faculty			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	FAS	27	6.9	6.9	6.9
	FBF	272	69.2	69.2	76.1
	FEGT	46	11.7	11.7	87.8
	FICT	26	6.6	6.6	94.4
	FSc	14	3.6	3.6	98.0
	ICS	8	2.0	2.0	100.0
	Total	393	100.0	100.0	

Year of Study

		Year_of_Study			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Year 1	33	8.4	8.4	8.4
	Year 2	130	33.1	33.1	41.5
	Year 3	227	57.8	57.8	99.2
	Year 4	2	.5	.5	99.7
	Year 5 and above	1	.3	.3	100.0
	Total	393	100.0	100.0	

Mobile / Internet Experience

		Mobile_Internet_Experience			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3-5 years	10	2.5	2.5	2.5
	6-10 years	126	32.1	32.1	34.6
	Ten years above	257	65.4	65.4	100.0
	Total	393	100.0	100.0	

Online Payment Experience

		Online_Payment_Experience			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No experience	1	.3	.3	.3
	0-2 years	53	13.5	13.5	13.7
	3-5 years	283	72.0	72.0	85.8
	6-10 years	56	14.2	14.2	100.0
	Total	393	100.0	100.0	

Appendix 1.4: Descriptive Analysis for Variables Data

Descriptive Statistics			
	N	Mean	Std. Deviation
PF1	393	2.6794	1.22225
PF2	393	2.7888	1.23043
PF3	393	2.7125	1.20639
PF4	393	2.7277	1.26155
PF5	393	2.8855	1.25747
PF6	393	2.6743	1.26804
FK1	393	3.2519	1.25769
FK2	393	3.2595	1.20535
FK3	393	3.3028	1.20264
FK4	393	3.3639	1.19839
FK5	393	3.3995	1.21248
OI1	393	3.2774	1.29635
OI2	393	3.3613	1.17878
OI3	393	3.3511	1.14235
OI4	393	3.2799	1.21765
OI5	393	3.3130	1.22527
OI6	393	3.3511	1.26928
OI7	393	3.4402	1.20251
OI8	393	3.3817	1.26244
OI9	393	3.4173	1.23673
RF1	393	3.2163	1.22539
RF2	393	3.2672	1.25656
RF3	393	3.3079	1.17775
RF4	393	3.3511	1.24902
RF5	393	3.3791	1.20639
SF1	393	3.2926	1.34140
SF2	393	3.3232	1.26164
SF3	393	3.1476	1.23866
SF4	393	3.2926	1.19667
SF5	393	3.2850	1.23932
SF6	393	3.3028	1.28071
WA1	393	3.6794	1.22016
WA2	393	3.7226	1.27652
WA3	393	3.5522	1.20287
WA4	393	2.2875	1.32144
WA5	393	2.2824	1.29525
Valid N (listwise)	393		

Appendix 1.5: Reliability Test Analysis Results for Pilot Test

Privacy Factor

Scale: Privacy_Factor

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.851	6

Financial Knowledge

Scale: Financial_Knowledge

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.884	5

Openness to Innovation

Scale: Openness_to_Innovation

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.941	9

Regulatory Factor

Scale: Regulatory_Factor

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.863	5

Security Factor

Scale: Security_Factor

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.888	6

Willingness to Adopt CBDC

Scale: Willingness_to_Adopt

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.832	5

Appendix 1.6: Reliability Test Analysis Result For Full Test

Privacy Factor

Scale: Privacy_Factor			
Case Processing Summary			
		N	%
Cases	Valid	393	100.0
	Excluded ^a	0	.0
	Total	393	100.0
a. Listwise deletion based on all variables in the procedure.			
Reliability Statistics			
Cronbach's Alpha		N of Items	
.719		6	

Financial Knowledge

Scale: Financial_Knowledge			
Case Processing Summary			
		N	%
Cases	Valid	393	100.0
	Excluded ^a	0	.0
	Total	393	100.0
a. Listwise deletion based on all variables in the procedure.			
Reliability Statistics			
Cronbach's Alpha		N of Items	
.709		5	

Openness to Innovation

Scale: Openness_to_Innovation

Case Processing Summary

		N	%
Cases	Valid	393	100.0
	Excluded ^a	0	.0
	Total	393	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.829	9

Regulatory Factor

Scale: Regulatory_Factor

Case Processing Summary

		N	%
Cases	Valid	393	100.0
	Excluded ^a	0	.0
	Total	393	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.702	5

Security Factor

Scale: Security_Factor

Case Processing Summary

		N	%
Cases	Valid	393	100.0
	Excluded ^a	0	.0
	Total	393	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.759	6

Willingness to Adopt CBDC

Scale: Willingness_to_Adopt

Case Processing Summary

		N	%
Cases	Valid	393	100.0
	Excluded ^a	0	.0
	Total	393	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.789	5

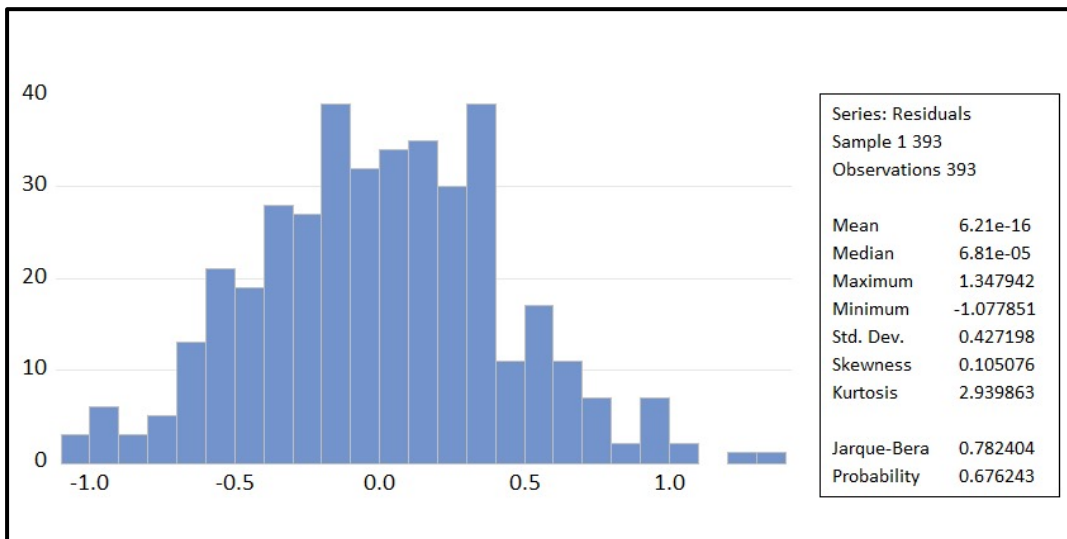
Appendix 1.7: Multicollinearity Test Analysis Result

Coefficients^a			
		Collinearity Statistics	
Model		Tolerance	VIF
1	Privacy_Factor	.593	1.687
	Financial_Knowledge	.403	2.479
	Openness_to_Innovation	.318	3.142
	Regulatory_Factor	.394	2.540
	Security_Factor	.392	2.553

a. Dependent Variable: Willingness_to_Adopt

Appendix 1.8: Normality Test Analysis Result

Descriptive Statistics					
	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Privacy_Factor	393	.589	.123	-.545	.246
Financial_Knowledge	393	-.530	.123	-.548	.246
Openness_to_Innovation	393	-.817	.123	-.312	.246
Regulatory_Factor	393	-.583	.123	-.497	.246
Security_Factor	393	-.598	.123	-.664	.246
Willingness_to_Adopt	393	-.636	.123	-.493	.246
Valid N (listwise)	393				



Appendix 1.9 : Heteroscedasticity Test: White Test

Heteroskedasticity Test: White				
Null hypothesis: Homoskedasticity				
F-statistic	1.187993	Prob. F(20,372)	0.2611	
Obs*R-squared	23.59417	Prob. Chi-Square(20)	0.2606	
Scaled explained SS	22.19129	Prob. Chi-Square(20)	0.3302	
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 04/14/24 Time: 11:03				
Sample: 1 393				
Included observations: 393				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.028318	0.306182	-0.092489	0.9264
PRIVACY_FACTOR^2	-0.011609	0.027712	-0.418930	0.6755
PRIVACY_FACTOR*FINANCIAL_KNOW...	-0.002615	0.043155	-0.060601	0.9517
PRIVACY_FACTOR*OPENNESS_TO_I...	-0.012036	0.049649	-0.242413	0.8086
PRIVACY_FACTOR*REGULATORY_FA...	-0.033745	0.045800	-0.736789	0.4617
PRIVACY_FACTOR*SECURITY_FACTOR	-0.015362	0.047600	-0.322730	0.7471
PRIVACY_FACTOR	0.260636	0.182215	1.430376	0.1534
FINANCIAL_KNOWLEDGE^2	-0.025465	0.028367	-0.897710	0.3699
FINANCIAL_KNOWLEDGE*OPENNESS...	-0.011154	0.057866	-0.192760	0.8473
FINANCIAL_KNOWLEDGE*REGULATO...	0.063299	0.044456	1.423860	0.1553
FINANCIAL_KNOWLEDGE*SECURITY_...	-0.038565	0.044823	-0.860369	0.3901
FINANCIAL_KNOWLEDGE	0.137548	0.173949	0.790737	0.4296
OPENNESS_TO_INNOVATION^2	0.069112	0.043000	1.607264	0.1088
OPENNESS_TO_INNOVATION*REGUL...	-0.087533	0.055186	-1.586150	0.1136
OPENNESS_TO_INNOVATION*SECURI...	0.043833	0.053508	0.819188	0.4132
OPENNESS_TO_INNOVATION	-0.184552	0.175454	-1.051857	0.2935
REGULATORY_FACTOR^2	0.005719	0.032308	0.177013	0.8596
REGULATORY_FACTOR*SECURITY_F...	0.073748	0.047312	1.558764	0.1199
REGULATORY_FACTOR	-0.076446	0.159030	-0.480700	0.6310
SECURITY_FACTOR^2	-0.038425	0.032094	-1.197257	0.2320
SECURITY_FACTOR	-0.004939	0.176834	-0.027930	0.9777
R-squared	0.060036	Mean dependent var	0.182034	
Adjusted R-squared	0.009500	S.D. dependent var	0.253858	
S.E. of regression	0.252649	Akaike info criterion	0.138323	
Sum squared resid	23.74533	Schwarz criterion	0.350664	
Log likelihood	-6.180566	Hannan-Quinn criter.	0.222471	
F-statistic	1.187993	Durbin-Watson stat	1.783613	
Prob(F-statistic)	0.261055			

Appendix 1.10: Multiple Linear Regression Analysis Result

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.839 ^a	.704	.700	.51123

a. Predictors: (Constant), Security_Factor, Privacy_Factor, Regulatory_Factor, Financial_Knowledge, Openness_to_Innovation

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	240.639	5	48.128	184.149	.000 ^b
	Residual	101.144	387	.261		
	Total	341.783	392			

a. Dependent Variable: Willingness_to_Adopt

b. Predictors: (Constant), Security_Factor, Privacy_Factor, Regulatory_Factor, Financial_Knowledge, Openness_to_Innovation

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.362	.122		-2.957	.003
	Privacy_Factor	.141	.042	.121	3.375	.001
	Financial_Knowledge	.178	.049	.158	3.625	.000
	Openness_to_Innovation	.338	.057	.288	5.877	.000
	Regulatory_Factor	.250	.050	.221	5.014	.000
	Security_Factor	.210	.049	.191	4.315	.000

a. Dependent Variable: Willingness_to_Adopt