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Original Paper

The Impact of the Usage of Cryptocurrency on Perceived Benefits and Users' Behavior

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Abstract

The purpose of this essay is to examine how consumers' behavior and perceived advantages are affected when they utilize cryptocurrencies. The basis for this study has been the Technology Acceptance Model. Three primary factors—reported ease of use, perceived advantages, and use behavior—were investigated in this research. Surveys are used in a quantitative way to gauge the influence of these elements. A total of 186 experts in the field of cryptocurrencies took part in the online questionnaire. Based on the structural equation model, it can be known that perceived ease of use presents a significant positive influence on perceived benefits, and perceived benefits also have a significant positive influence on user behaviour, and perceived ease of use does not have a significant influence on user behaviour, but with the extension of the use time, the user's perception of ease of use of cryptocurrencies is enhanced. Through logistic regression, it can be learned that perceived benefits and user behaviour have a significant positive impact on cryptocurrency. That is, the greater the perceived benefits of using cryptocurrencies, the greater the likelihood that users will use cryptocurrencies, and the greater the amount of usage is likely to be. Similarly, users' actual behaviour towards cryptocurrencies significantly contributes to the development and use of cryptocurrencies. Based on the above empirical results, this paper provides certain suggestions and outlooks for the future development of cryptocurrencies.

Keywords

cryptocurrency adoption, TAM, structural equation model (SEM), logistic regression

1. Introduction

1.1 Background

The field of e-commerce has experienced rapid growth with the spread of modern technologies such as the Internet and smartphones. This development has given rise to a plethora of innovative and secure payment technologies. This trend has directly fuelled the demand for digital currencies (Saldivar et al., 2023). These currencies utilise advanced technological means to secure electronic transactions without relying on traditional centralised administrations. These technologies enable peer-to-peer transactions

to take place without the involvement of a central clearing house or other intermediaries, as compared to traditional methods of international settlement. This change not only improves the efficiency of financial transactions, but also significantly reduces transaction costs, especially for cross-border transactions (Raymaekers, 2015). By providing a payment method that is both economical and secure, these technologies are strategically important in expanding the reach of financial services. Further, innovations in blockchain technology have brought an entirely new way of exchanging money - digital currencies. The transfer of such currencies is realised through cryptographic networks without the intervention of financial intermediaries. The transaction process of cryptocurrencies relies entirely on cryptography, thus ensuring the security and transparency of transactions. This decentralised way of exchanging money not only provides a new payment option for individuals and businesses, but also brings infinite possibilities for the future development of the financial industry.

1.2 Significance of the Research

Cryptocurrency is becoming more widely used and preferred mode of making transactions worldwide which calls for better understanding. This research is looking to investigate the factors that impact user behaviour in South Africa. The findings of the research article will significantly enhance the current body of literature. The primary contribution is to understand how individuals' perspectives about cryptocurrencies are influenced by their exposure to both positive and negative information about bitcoin. The second contribution is to get a comprehensive understanding of public concerns about cryptocurrencies, since these concerns serve as the primary barrier impeding the mainstream adoption of cryptocurrencies. In the financial technology industry, the third contribution is in the use of existing research to predict prospective future use cases and applications of cryptocurrencies. The last contribution will predict the future growth and increased adoption of cryptocurrencies due to growing consumer demand, based on an analysis of past patterns in this field.

1.3 Scope

The study will focus on South Africa and it will involve 186 individuals picked randomly from different parts of South Africa with age ranging from 18-65 years. The South African economy has not embraced cryptocurrency very well since it’s still new and many are still not very familiar with it.

2. Related Literature

2.1 Introduction

Since the debut of Bitcoin in 2009, cryptocurrencies and blockchain technology have become the subject of extensive research (Ametrano, 2016). Nonetheless, the popularity model of Bitcoin and how blockchain features shape consumer trust are questions that need to be further explored in depth. Digital currencies, which refer to monetary balances recorded electronically on stored value cards, electronic intermediaries, or networks, allow value to be transferred over the Internet (Turban et al., 2018). The acquisition, storage, access and transaction of digital currencies can be realised electronically. In addition, digital currencies can be used in a variety of application scenarios, as long as

the parties to the transaction agree on the terms of the contract.

The development of cryptocurrencies has been particularly prominent in the wave of Internet finance, and the concepts behind them are closely related to virtual currencies (Sas & Khairuddin, 2017). In 2008, an anonymous developer or team named Satoshi Nakamoto published a paper describing the concept of Bitcoin, an emerging virtual currency (Nseke, 2018). The creation of Bitcoin marked the first time that peer-to-peer exchange of money was handled through a secure network environment without the intervention of a third party. Since Bitcoin has successfully tackled the challenges of trust and duplicate payments that are common in the field of digital currencies, it has become one of the most famous cryptocurrencies. In addition, Bitcoin's rapid rise to prominence is due to its four core strengths:

- Its lightning-fast transaction times
- Minimal transaction fees
- High level of anonymity
- Decentralized governance

Digital currencies, as an emerging payment method, offer new options for customers, which has inspired significant capital investment in innovative payment systems. However, trading and holding of virtual currencies is accompanied by significant risks. Digital currency markets and their transactions are currently subject to only limited regulation and control. The widespread use of Bitcoin in illegal transactions, such as drug dealing and money laundering, has damaged the reputation of cryptocurrencies and eroded investor trust. While Bitcoin is favoured for the high level of privacy protection it offers, its convenience has also raised concerns.

More research is needed in order to gain insight into the factors influencing cryptocurrency adoption. A fascinating study explored the factors influencing the use of Bitcoin, which constructed a research framework based on the Technology Acceptance Model (TAM) and assumptions from previous studies (Turban et al., 2018). The study also synthesised the potential benefits of using Bitcoin with the risks faced by users. The TAM is a well-understood theory that explains why the public has widely adopted various types of new technology. Information systems theory also addresses the potential for consumers to absorb and use cutting-edge technologies. The theory suggests that when consumers are exposed to new technologies, a variety of factors will influence their expectations about when and how the new technology will be used. These expectations are influenced by a variety of factors.

2.2 Theoretical Background

In the current field of research, numerous theoretical models are used to explore people's reactions to technology and how they use it. Despite the emergence of new models, the Technology Acceptance Model (TAM) has maintained its popularity (Nair & Cachanosky, 2017). This model focuses on analysing how people interact with computer systems. TAM was developed based on the Theory of Reasoned Action (TRA), which aims to explain the behavioural patterns of users of computer applications in different cultures and to identify the key factors that influence the adoption of

information systems (Abramova & Böhme, 2016). The theory of reasoned action provides the theoretical foundation for TAM. Numerous factors, including TAM's influence on an individual's psychological state and the external environment, affect the rate at which people accept new technologies, and TAM was originally designed to take these individual factors into account. The model aims to provide a theoretical basis for monitoring how these factors influence people's attitudes, intentions and actual use of ICT (Davis, 1989). The Technology Acceptance Model (TAM) identifies two factors in particular that are closely related to an individual's behaviour in accepting digital tools: utility and ease of use. Utility refers to the extent to which users perceive that the use of computer technology is likely to improve their job performance, while ease of use relates to the ease and lack of frustration users experience when interacting with computer software or hardware. Davis defines this rate of interest as the user's expectation of the performance improvement that may result from the use of computer technology (Venkatesh, 2000). TAM is premised on the assumption that these two criteria together determine an individual's propensity to engage in technological activities, which in turn is influenced by a variety of personal characteristics. In addition, the TAM assumes that there is a measurable relationship between user perceptions and these factors. The model assumes that individuals' motivation to use IT stems from their inclination and endorsement factors towards IT. As Venkatesh (2000) points out, expected use is the most critical factor in the actual use of technology.

The main objective of this study is to explore customers' intentions to adopt cryptocurrencies. Previous studies have used predictors from the Technology Acceptance Model (TAM) to elucidate and predict the use of novel systems. In order to more fully assess cryptocurrency acceptance, other theoretical frameworks have been considered, as relying on the TAM alone is insufficient for a full understanding. Concepts of intentional and rational behaviour, extracted from LaCaille's previous research on technology utilisation, may be integrated to demonstrate the acceptance and propensity of adopters towards Bitcoin. These conceptual theories provide a theoretical framework for understanding the underlying goals of human behaviour in a given context. They contribute to a deeper understanding and appreciation of technology use and provide support for the Technology Acceptance Model.

A considerable body of research has included the Technology Acceptance Model as a framework to enhance comprehension and forecast human behavior in the context of technology adoption. Furthermore, the level of technological awareness among consumers plays a pivotal role in fully understanding and appreciating the essential components of this model. These components include perceived utility and simplicity of use, as well as perceived usefulness. These factors are essential for gaining a comprehensive understanding of the customer's behavioral motivations in adopting new technology. Fagnant and Kockelman (2015) assert that behavioral intention serves as the most precise measure of individuals' activities, such as using a system or information system, as well as their intentions to adopt new technologies. The technology acceptance model determinants aid consumers in making optimal decisions about technology adoption by guiding them through the various processes and procedures.

2.3 Technology Acceptance Theories and Literature Review

The rate at which payment systems grow is influenced by the clash between swift technological progress and inherent barriers to the acceptance of new products and services. Multiple theories exist regarding the motivations behind people's adoption and desire for new technologies. Diffusion, according to the Theory of Diffusion of Innovations (DIT) established in 1960, refers to the gradual spread of a new idea or technology among individuals in a social system through specific communication channels (Granić & Marangunić, 2019). Couros (2003) defines the concept as the "systematic dissemination of an innovation to individuals within a social system using specific channels over a specific timeframe". Parasuraman and Colby (2015) define "technology readiness" (TR) as the inclination of individuals to embrace and employ new technology in both their personal and professional spheres. An appropriate approach to analyze the practical application of technology is through the utilization of the Theory of Task-technology Fit (TTF), particularly when evaluating novel technology and receiving input. According to Hale et al. (2002) Theory of Reasonable Action (TRA), a person's performance of a specific activity is influenced by their behavioral intention (BI), which is affected by their attitude and subjective norm (SN) towards that behavior. The Theory of Planned Behavior (TPB) and the Decomposed Theory of Planned Behavior provide explanations for the connection between beliefs and behavior. The initial two elements correspond to the theory of rational behavior, while the users' perceived agency in their actions constitutes the third element. Shih and Fang (2020) employed the Theory of Planned Behavior (TPB) and broke down TPB to examine the acceptance of online banking.

The Technology Acceptance Model (TAM) is a highly recognized and extensively utilized theory (Folkinshteyn & Lennon, 2016). It underwent refinement and reached its ultimate version, with a specific emphasis on users' behavioral intentions to adopt and utilize new technology. The Technology Acceptance Model 2 (TAM2) can be classified into three main categories, as proposed by Venkatesh and Davis in 2000. Initially, through the activation of the TAM construct, it effectively dealt with psychological concerns (Ametrano, 2015). Furthermore, it substantiated the importance of the TAM construct by offering theoretical support (Raithatha & Haldar, 2021). Furthermore, the identification of an additional element served to enhance the original TAM framework.

The objective of the Technology Acceptance Model (TAM) was to elucidate individuals' responses to novel technologies by specifically examining their reactions as users. The Technology Acceptance Model 3 (TAM3) was developed by combining the model of determinants of perceived ease of use (PEU) by Venkateshand TAM 2 by Venkatesh (2000) and Davis (1989), as proposed by Venkatesh and Bala. TAM 3 presents a detailed network of factors that explain consumers' behavioral intention to utilize technology. The elements include human differences, system characteristics, societal impact, and facilitating conditions.

According to Venkatesh et al. (2000) Unified Theory of Acceptance and Use of Technology (UTAUT), the four elements that define users' behavioral intention are performance expectation, effort expectancy,

social influence, and enabling conditions. The UTAUT model's performance expectation consists of five comparable constructs: perceived usefulness, extrinsic motivation, job-fit, relative advantage, and outcome expectancies. The notions of complexity, Perceived Ease of Use (PEU), and its extension, the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), include the factor of effort expectation, as discussed by Venkatesh et al. (2000) In order to do this, the following measures were implemented: (1) Selecting three key dimensions identified in previous studies on technology adoption and usage by consumers and researchers. (2) Modifying some of the connections in the original UTAUT framework. (3) Introducing new relationships that align with the guidelines provided by Johns, Alvesson and Kärreman (2011) for expanding a theory in a new context, as well as incorporating suggestions from the TAM special issue of the Journal of the AIS to enhance the user-friendliness of the theory.

3. Methodology

3.1 Sample Design and Data Collection

The sampling technique is centred on the selection of representative data from the target group rather than a comprehensive collection from the entire population. The sample data collected will be analysed in depth through the PLS-SEM (Partial Least Squares Structural Equation Modelling) analysis method. In the survey conducted in Pakistan, a response rate of 56 per cent was achieved. In order to reduce the impact of non-response bias on the results of the study, a wider sample coverage is recommended. Primary data was collected through an online survey link and distributed to target respondents through social media, personal relationships and acquaintance networks. A multi-dimensional questionnaire was designed with the aim of exploring and analysing users' attitudes, perceptions and behavioural patterns towards cryptocurrencies, and this data will provide the basis for subsequent analysis. The questionnaire not only covers basic demographic information such as gender, age and education level, but also delves into aspects such as how long users have been exposed to cryptocurrencies, their perceptions of their advantages, and the ease or difficulty in using them.

In this paper, the collected data were strictly screened and sorted to ensure the accuracy and credibility of the dataset, and the preliminary analysis of the resulting data revealed the significant characteristics and development trends of users' cryptocurrency usage.

3.2 Research Questions Development

The research questions were formulated from the aim of the study and they were stated as follows:

- Research Question 1 (RQ1): Is there a correlation between how simple people find it to use cryptocurrencies and how they really spend their crypto currencies?
- Research Question 2 (RQ2): Does one's opinion of cryptocurrency's use affect one's opinion of its value?

This study focuses on two particular aspects of the TAM: the ease of use that users believe cryptocurrencies to have, as well as the perceived advantages that come from dealing with transactions,

control and safety, and scalability. This study investigates the influence of these various characteristics on the desired user behavior. The conceptual framework for the analysis is shown in Figure 1, and this foundation served as the basis for formulating the hypotheses.

The use of a 5-point Likert scale is a valid research method in the social and behavioural sciences. This scale is specifically designed to assess the extent to which an individual agrees or disagrees with a particular statement. In this study, the questionnaire was designed using a 7-point Likert scale, which provided participants with a richer range of options and thus allowed for a more complete reflection of their feelings and opinions. Several studies have pointed out that the strength of the 7-point scale is that it is effective in reducing participants' misunderstandings. Venkatesh et al. proposed the UTAUT2 model, while Buabeng-Andoh built on it by using a 4-item scale to assess the propensity of students in Accra, the capital of Ghana, to adopt mobile learning. The scale covered the key constructs of social norms (SN), perceived usefulness (PU) and perceived ease of use (PEU). In measuring these constructs, the researcher used different numbers of scale items: four items were used to measure perceived ease of use (PEU), while five items were used to measure perceived usefulness (PU).

3.3 Conceptual Framework

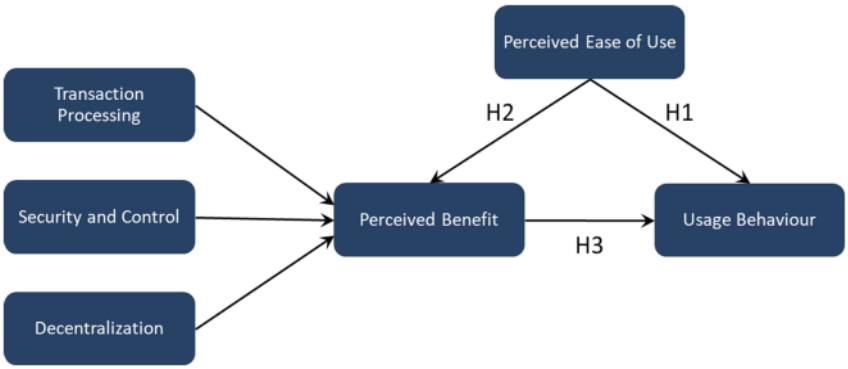

Figure 1. TAM Model

The Technology Acceptance Model (TAM) is a widely used framework for analysing individuals' behaviour towards the adoption of emerging ICT.TAM is based on two core belief dimensions: perceived usefulness (i.e., the extent to which individuals believe that the use of a technology will enhance their job performance) and perceived ease of use (i.e., the extent to which individuals believe that it is convenient to use a technology). These two dimensions are considered to be key factors in shaping users' attitudes, which in turn influence their intention to use and actual adoption behaviour. According to TAM, the higher the ease of use of a technology, the more likely an individual is to perceive it as useful, and this usefulness directly contributes to the formation of intention to use.

The study's challenge and associated research questions are designed to help us examine the following hypotheses:

- H1: Users' behaviors in regards to making purchases using cryptocurrencies are strongly correlated with how simple they perceive the process to be in their minds.

- H2: perceived Ease of use has a mediating effect on perceived benefit on user behaviour.
- H3: Perceived benefit has a substantial impact on user behavior.

This study proposes the following model based on the TAM model of Davis et al. as shown below:

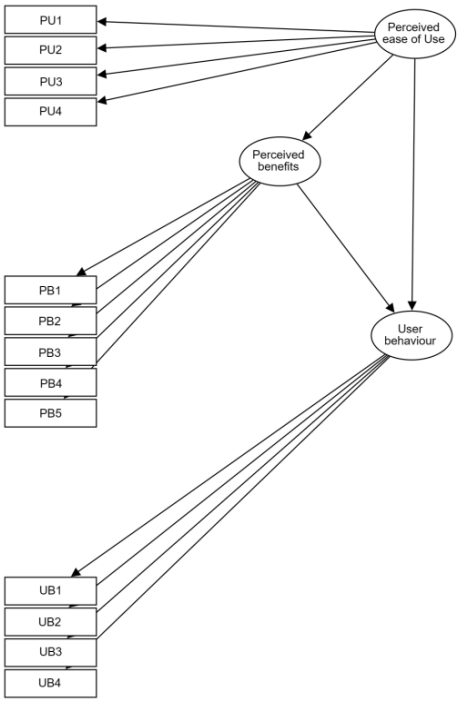

Figure 2. Modeling Framework

The model above shows the link between perceived ease of use, perceived benefits and user behavior. This logistic regression model will use the following equation i:

$$Y'_i = b_0 + b_1X_{1i} + b_2X_{2i} + b_3X_{3i} \quad \text{(i)}$$

Where Y is the dependent variable and b_0 is the intercept while b_1 and b_2 are slopes. X_1, X_2 and X_3 are independent variables.

Replace the variables in the logistic regression model:

$$V=b_0+b_1(\text{Perceived ease of Use})+b_2(\text{Perceived benefits})+b_3(\text{User behaviour}) \quad \text{(ii)}$$

3.4 Research Design

A research design is an overarching blueprint for the study. It comprises three independent but interconnected elements: the methodology used, the research strategy employed, and the time frame considered. The structure of the study is based on the subcategorization of these variables. "Research designs are plans and processes for research that incorporate various choices from broad assumptions to comprehensive approaches to data collection and analysis, Banu (2020). Research designs provide a structure within which particular methods of data collecting and analysis may be selected, as Saunders explains. A research design is a plan for how you'll collect and analyze the information that will be used to reply to your research question. This study will use quantitative techniques to address the research

objectives. According to Gkillas et al. (2022), the research design plays a vital role in establishing a relationship between theories and arguments, in addition to providing guidance for the process of gathering and evaluating data in the study. The research design is a selection and arrangement of evidence that helps a researcher create a framework to acquire and evaluate data. This definition can be found in the work of Yadav et al. (2022). According to Saunders (2019), philosophical conflicts during research are an intrinsic component of the study, which must be considered while planning research. These divergent points of view occur due to disparities in the assumptions of the opinions held by researchers while they work within each philosophical framework.

3.5 Descriptive Research

The study will also utilize secondary data where the data will be used to further analyze the situation of cryptocurrency adoption. The case study method is based on asking "how" and "why" questions to understand complicated structures or new phenomena that are affected by many things and to give more detailed explanations of reality that fit the situation and goal of the observations. Using blockchain technology in the supply chain, especially in supply chain finance, is still very new, but it has the potential to solve many problems related to data integrity, trust, and openness, as well as automating transaction processes. Because of this, the case study method was used in this research.

3.6 Population and Sampling Technique

As indicated in the introduction, cryptocurrencies are digital forms of money that rely on blockchain technology. To utilize them effectively, one must possess a certain degree of technical and financial expertise. This study focused on individuals who have either graduated from or are currently enrolled in business schools or colleges, since they are the most engaged, well-informed, and significant participants in the financial markets. The data for this inquiry were collected using the cluster area sampling methodology. The main reason is that the COVID-19 pandemic's state of law and order renders the conventional random sampling method impractical, posing difficulties in physically visiting each institution. Hence, the survey was restricted to a certain, randomly chosen location. Furthermore, both the registrar's office of public business schools and the official website of the Higher Education Commission of Pakistan lack the latest university-wide enrollment list of students and staff. Furthermore, when compared to alternative probability sampling procedures, the cluster area sampling methodology stands out as the most cost-effective and efficient approach.

3.7 Data Analysis

Data analysis' refers to the collation and exploration of data to draw conclusions about a study. This process is a logical way to simplify analysis by breaking down large data sets into smaller pieces. There are three key steps that occur in the process of data analysis. The first is structuring the data, i.e., aggregating and categorising the data, which is an effective method of data simplification that helps to reveal common themes and patterns in the data, which in turn simplifies the complexity of identifying and correlating them. Secondly, the researcher will employ two methods of analysis: top-down and bottom-up, both of which allow for a deeper understanding of the data from different perspectives. Data

analysis is a creative and passionate process of discovery, even though it can be accompanied by chaos and confusion and requires a significant investment of time. Through this process, the researcher is able to give order, structure and deeper meaning to the vast amount of data collected.

3.8 Reliability and Validity

The term "reliability" describes the consistency with which tools may produce the same outcomes. Let's assume that your study is widely acknowledged as having high trustworthiness among scholars. If this is the case, then other researchers must be able to replicate your findings by using identical procedures and copying your study's conditions. It has been pointed out that "reliability difficulties could present themselves in various ways." There is a greater possibility of error when more than one individual is providing the data source since there is no foolproof method to protect against the observer's predisposition for subjectivity.

4. Results and Analysis

4.1 Descriptive Statistics

This paper assigns values to the following questions in the questionnaire: your gender: 0=male, 1=female; your age group: 1=18-28 years, 2=29-38 years, 3=39-48 years; your education: 1=Bachelor, 2=(postgraduate); and time spent using cryptocurrencies: 1=1-2years, 2=3-4years.

From the table below, it can be seen that the average score for most aspects is around 4, which indicates that users are generally positive about various aspects of cryptocurrencies, especially for "instant money transfer", "ability to transfer money globally", "no need to go through core institutions" and "decentralised speed", which shows that users praise these features of virtual currencies. In particular, for "instant transfers", "ability to transfer money globally", "no need to go through a core institution" and "speed of decentralisation", the average rating is close to 4.5, which shows that users praise these features of virtual currencies.

Overall, users have a high opinion of the ease of use of cryptocurrencies and do not find it difficult to learn and use them. However, the relatively low actual usage behaviour of users may mean that users are still learning how to use cryptocurrencies more effectively.

Table 1. Descriptive Statistics of Questionnaire Questions

factor	sample volume	minimum	maximum	average	standard deviation	median
Age	186	1	3	1.027	0.219	1
Gender	186	0	1	0.468	0.5	0
Education	186	1	2	1.011	0.103	1
PU1	186	4	5	4.027	0.162	4
PU2	186	4	5	4.968	0.177	5

PU3	186	3	5	4.946	0.249	5
PU4	186	3	5	4.941	0.258	5
PB1	186	4	5	4.027	0.162	4
PB2	186	4	5	4.043	0.203	4
PB3	186	4	5	4.952	0.215	5
PB4	186	4	5	4.957	0.203	5
PB5	186	4	5	4.048	0.215	4
UB1	186	1	2	1.011	0.103	1
UB2	186	4	5	4.043	0.203	4
UB3	186	3	5	4.048	0.239	4
UB4	186	4	5	4.957	0.203	5
V	186	4	5	4.952	0.215	5
Perceived Ease of Use	186	20	25	22.011	0.375	22
User Behaviour	186	16	20	17.989	0.345	18
Perceived Benefits	186	21	25	22.038	0.301	22

4.2 Reliability Test

As known from the table, the value of reliability coefficient is 0.649, which is greater than 0.6, indicating that the reliability of the questionnaire is acceptable and the data can continue to be analyzed.

Table 2. Cronbach Reliability Testing

Considerations	CITC	Deleted α coefficients for item	Cronbach α
Gender	-0.022	0.710	0.649
Age	0.559	0.603	
Education	0.762	0.616	
V	0.166	0.644	
Perceived Ease of Use	0.649	0.562	
Perceived Benefits	0.643	0.576	
User Behaviour	0.701	0.557	
PU1	0.342	0.631	
PU2	-0.168	0.670	
PU3	0.063	0.657	
PU4	0.092	0.654	
PB1	0.186	0.643	

PB2	0.350	0.627
PB3	-0.075	0.668
PB4	-0.088	0.667
PB5	0.103	0.650
UB1	0.329	0.638
UB2	0.366	0.625
UB3	0.119	0.650
UB4	0.167	0.644

In this paper, KMO and Bartlett's test were used to validate the validity, as can be seen from the table below: the KMO value is 0.674, which is between 0.6 ~ 0.7, and the survey data is more suitable for extracting information for further analysis.

Table 3. Validity Testing

KMO and Bartlett testing		
KMO		0.674
Bartlett Sphericity Inspection	Approximate chi-square	150.064
	df	3
	p	0.000

4.3 Qualitative Analysis

Table 4. Gender

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Female	87	46.8	46.8	46.8
	Male	99	53.2	53.2	100.0
	Total	186	100.0	100.0	

In this paper, 53.2% of the respondents were male and 46.8% were female, which is basically a balanced ratio between men and women.

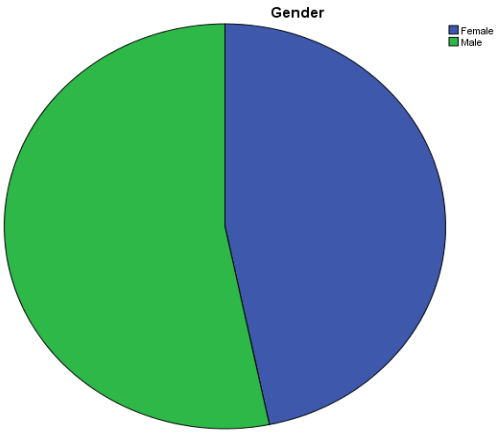

Figure 3. Gender

Table 5. Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-28	183	98.4	98.4	98.4
	29-38	1	0.5	0.5	98.9
	39-48	2	1.1	1.1	100.0
	Total	186	100.0	100.0	

Most of the respondents were between 18-28 with a response rate of 98.4%. This shows that most of the respondents are young.

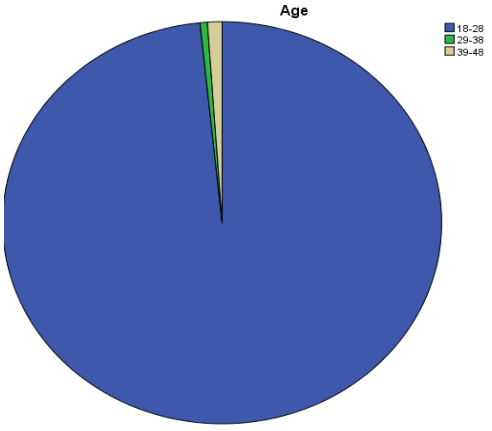

Figure 4. Age

Table 6. Education

		Frequency	Percent	Valid Percent	Cumulative Percent
	Bachelor	184	98.9	98.9	98.9
Valid	Master	2	1.1	1.1	100.0
	Total	186	100.0	100.0	

In this study, 98.9% of the respondents had a bachelor's degree, and the remaining 1.1% were graduate students.

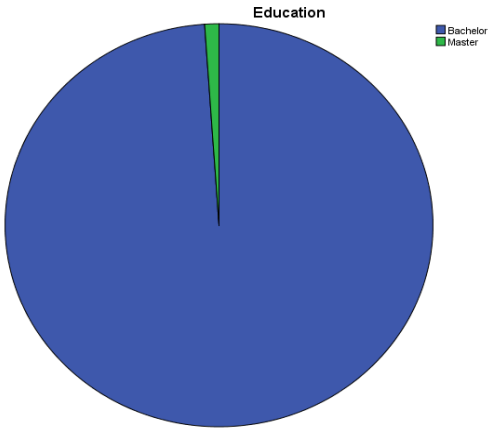

Figure 5. Respondent Education Level

Table 7. Time of Using Cryptocurrency

		Frequency	Percent	Valid Percent	Cumulative Percent
	1 to 2 years	184	98.9	98.9	98.9
Valid	3-4 years	2	1.1	1.1	100.0
	Total	186	100.0	100.0	

From the chart we can clearly see that most of the respondents have been using virtual currencies for 1-2 years and only two have been using them for 3-4 years. We can find that virtual currencies have gained more and more people's attention and acceptance, but still face some problems about long-term stability.

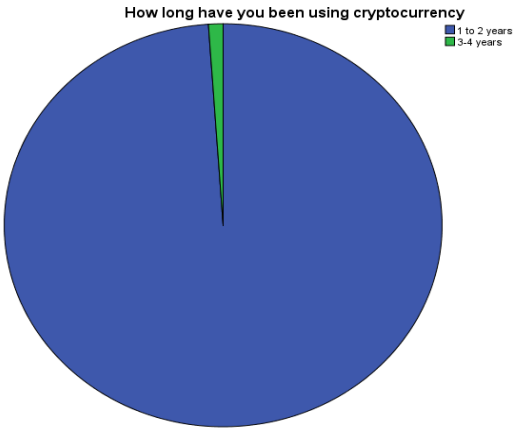

Figure 6. Time to Use Cryptocurrency

4.4 Quantitative Analysis

My findings were further supported by data generated by chain analysis. Their research found that South Africa is among the top countries that have adopted cryptocurrency well in the sub-Sahara.

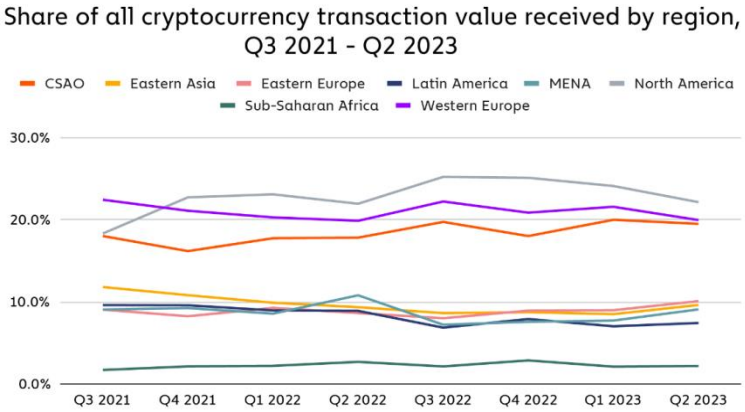

Figure 7. Cryptocurrency Trading Volume

Despite the historically limited size of cryptocurrency marketplaces in Sub-Saharan Africa, a comprehensive analysis reveals that this technology has successfully penetrated substantial markets and assumed a key role in the everyday lives of many individuals. Nigeria serves as a prime example of this phenomenon, as it ranks first in terms of raw transaction volume and secures the second position on our Global Crypto Adoption Index, which will be further explored in subsequent sections. Kenya, Ghana, and South Africa are identified as countries within the region that have favorable performance on the index.

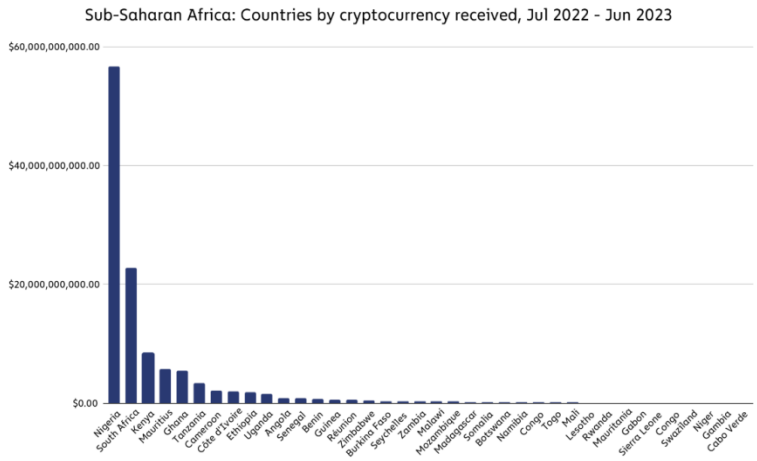

Figure 8. Cryptocurrencies in Sub-Saharan Africa

The inhabitants of Sub-Saharan Africa are using digital gold as an alternative medium of exchange. Given the prevalence of inflation and debt in several countries in the area, cryptocurrencies have emerged as an enticing means to economize, save wealth, and attain more financial autonomy. As an example, Ghana's inflation rate surged to 29.8% in June 2022, marking the highest level in two decades, after a consecutive increase of 13 months. Due to the limited availability of financial opportunities, a significant proportion of Ghanaians have turned to Bitcoin. It seems improbable that South Africa, Kenya, and Nigeria have had similar challenges in recent times and exhibit significant levels of grassroots bitcoin acceptance.

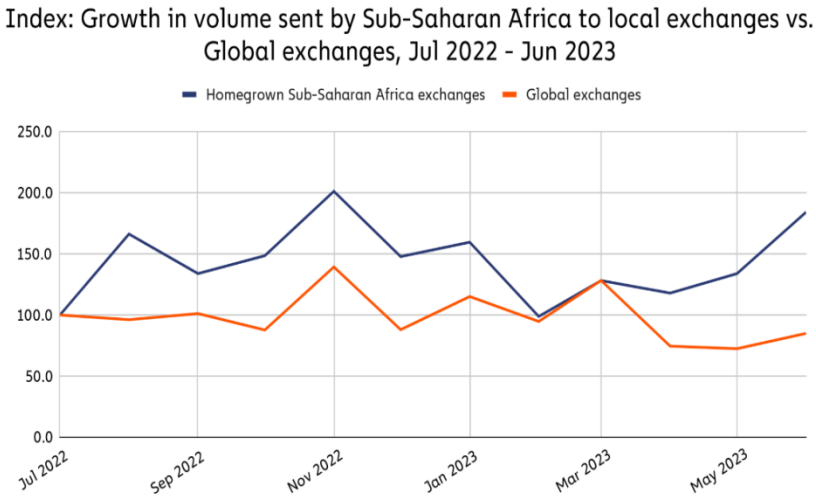

Figure 9. African Local Exchanges

4.5 Validated Factor Analysis

From the table below, it can be seen that the absolute value of the standardized loading coefficient of PU4 for Perceived ease of Use is 0.763>0.6, which means that the measurement relationship is strong.

The measurement relationships of PB2, PB3 and PB5 for Perceived benefits are relatively strong. The measurement relationships of UB2 and UB5 for User behaviour are relatively strong and all of them are significant. UB2 and UB5 are relatively strong for User behaviour and both are significant. Other factors PU1, PU2, PU3, PB1, PB4, UB1 and UB4 have relatively weaker relationships, but overall the indicator system is well constructed and can be analysed in the next step.

Table 8. Table of Factor Loading Coefficients

Factor	measurements	Coef.	Std. Error	*z*(CR)	*p*	Std. Estimate	SMC
Perceived ease of Use	PU1	1.000	-	-	-	0.384	0.148
Perceived ease of Use	PU2	-1.435	0.342	-4.192	0.000	-0.505	0.255
Perceived ease of Use	PU3	-2.158	0.500	-4.314	0.000	-0.540	0.292
Perceived ease of Use	PU4	-3.162	0.657	-4.810	0.000	-0.763	0.582
Perceived benefits	PB1	1.000	-	-	-	0.564	0.318
Perceived benefits	PB2	1.826	0.219	8.325	0.000	0.821	0.673
Perceived benefits	PB3	-2.144	0.243	-8.806	0.000	-0.911	0.830
Perceived benefits	PB4	-2.130	0.236	-9.026	0.000	-0.957	0.916
Perceived benefits	PB5	2.316	0.253	9.139	0.000	0.984	0.968
User behaviour	UB1	1.000	-	-	-	0.376	0.142
User behaviour	UB2	4.422	0.848	5.214	0.000	0.846	0.716
User behaviour	UB3	4.317	0.867	4.981	0.000	0.704	0.495
User behaviour	UB4	-2.631	0.595	-4.418	0.000	-0.504	0.254

As we all know, discriminant validity is an important consideration in conducting validated factor analysis, which is used to assess whether the factors in the model are sufficiently independent from each other. Based on the data obtained from the questionnaire, this paper evaluates the discriminant validity of the three main factors, i.e., Perceived Ease of Use, Perceived Benefits and User Behaviour.

First, the square root of Average Variance Extracted (AVE) for Perceived Ease of Use is 0.565, which is higher than the absolute maximum value of correlation coefficients between this factor and the other factors of 0.288, suggesting that Perceived Ease of Use has a good discriminant validity, i.e., it is able to independently reflect the user's perceived ease of use of cryptocurrency. Second, the AVE square root value of Perceived Benefits is 0.861, which is also higher than the absolute maximum of the correlation coefficients with the other factors of 0.429, which indicates that Perceived Benefits also has good discriminant validity, i.e., it is able to effectively measure users' perceptions of the potential benefits brought by cryptocurrencies.

Table 9. Distinguishing validity: Pearson's Correlation and AVE Square Root Values

	Perceived ease of Use	Perceived benefits	User behaviour
Perceived ease of Use	0.565		
Perceived benefits	-0.159	0.861	
User behaviour	-0.288	0.429	0.634

4.6 Correlation

Table 10. Correlations

		Perceived Ease of Use	**User Behaviour**	**Perceived Benefits**
Perceived Ease of Use	Pearson Correlation	1	0.461**	0.476**
	Sig. (2-tailed)		0.000	0.000
	N	186	186	186
User Behaviour	Pearson Correlation	0.461**	1	0.630**
	Sig. (2-tailed)	0.000		0.000
	N	186	186	186
Perceived Benefits	Pearson Correlation	0.476**	0.630**	1
	Sig. (2-tailed)	0.000	0.000	
	N	186	186	186

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation analysis is performed to measure the existence of significant relationships between each pair of variables in this study. Pearson's r correlation coefficients were calculated and reported in Table 3. Perceived Ease of Use has a correlation with both user behaviour and perceived benefit with a value of 0.461 and 0.476 respectively. User behaviour is correlated with perceived benefits with a person's value of 0.630. The results were similar to those of Alqaryouti et al. who found that, there was no significant correlation between Perceived Benefit and Perceived Ease of Use and between Perceived Benefit and Usage Behaviour as p-values exceeded 0.05. However, there was a significant correlation between Perceived Ease of Use and Usage Behaviour. No significant correlation was found between Perceived Benefit and Usage Behaviour.

4.7 Structural Equation Model Fitting Analysis

Based on the assumptions made above and the data obtained from the questionnaire, this paper designed a structural equation model with 3 latent variables and 13 observed variables, fitted and analysed them, and obtained a table of model fitting results and a graph of model results.

The table below shows us the fitting results of the structural equation model, which allows us to

explore the relationship between perceived ease of use, perceived benefit and user behaviour.

Table 11. Structural Equation Model Fitting Results

X	→	Y	B	SE	z (CR value)	p	β
Perceived ease of Use	→	Perceived benefits	1.244	0.291	4.272	0.000	0.847
Perceived ease of Use	→	User behaviour	0.185	0.099	1.869	0.062	0.297
Perceived benefits	→	User behaviour	0.304	0.084	3.619	0.000	0.715
Perceived ease of Use	→	PU1	1	-	-	-	0.384
Perceived ease of Use	→	PU2	-1.436	0.343	-4.187	0.000	-0.504
Perceived ease of Use	→	PU3	-2.159	0.501	-4.31	0.000	-0.54
Perceived ease of Use	→	PU4	-3.166	0.659	-4.805	0.000	-0.763
Perceived benefits	→	PB1	1	-	-	-	0.564
Perceived benefits	→	PB2	1.826	0.219	8.321	0.000	0.82
Perceived benefits	→	PB3	-2.145	0.244	-8.802	0.000	-0.911
Perceived benefits	→	PB4	-2.131	0.236	-9.022	0.000	-0.957
Perceived benefits	→	PB5	2.317	0.254	9.135	0.000	0.984
User behaviour	→	UB1	1	-	-	-	0.376
User behaviour	→	UB2	4.427	0.85	5.205	0.000	0.846
User behaviour	→	UB3	4.328	0.87	4.975	0.000	0.704
User behaviour	→	UB4	-2.638	0.597	-4.415	0.000	-0.504

Notes. → indicates a regression effect relationship or a measurement relationship.

A '-' indicates that the item is a reference item.

The first thing we see is that the effect of perceived ease of use on perceived benefit is significantly positive, i.e., the higher the user's perceived ease of use the greater their perceived benefit. It can also be found that the standard regression coefficients of PU2, PU3, PU4 are all negative, and the standard regression coefficients of PU1 are positive and less than 1, while the p-values are all less than 0.0001, which indicates that perceived ease of use has a significant negative impact on PU2, PU3, PU4, while it has a significant positive impact on PU1, which suggests that users believe that using cryptocurrencies can make it easier for them to transfer money, which increases their perceived benefits. This is similar of what was found by other studies. One of the most significant factors influencing intention to use Bitcoin amongst users is perceived ease of use. In order for a new technology to garner wider acceptance, it must exhibit the characteristic of being easy to navigate and transact with. Since its inception, Bitcoin has become easier to obtain and transact with. The development of cellular phone and mobile device applications and adoption by PSPs have increased the cryptocurrencies adoption and

use rate. This finding correlates with Bitcoin adoption studies by Folkinshteyn and Lennon (2016), Sas and Khairuddin (2017) and more recently Arias-Oliva et al. (2015). These studies conclude that ease of use has a positive significant influence on intention to use Bitcoin.

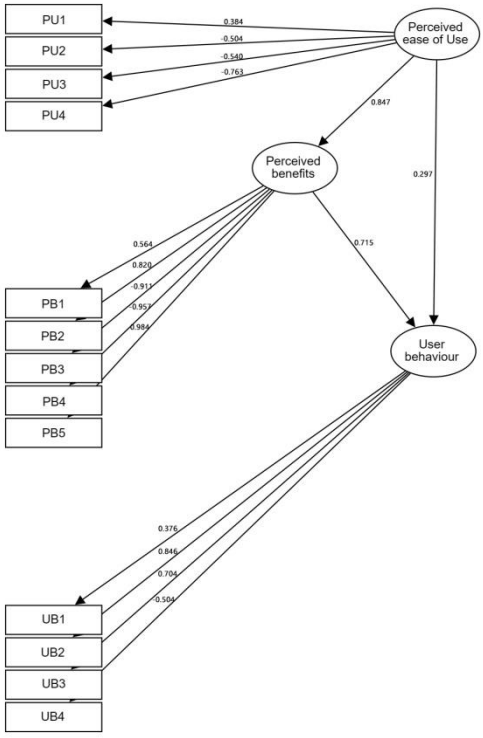

Figure 10. Plot of Model Fitting Results

The model fit was tested and it was found that the p-value was 0.000<0.0001 and the RMR value was 0.004<0.05, which indicates that the overall model fit was good.

4.8 Regression

The paper also concludes with a logistic regression with cryptocurrency (V) as the dependent variable and perceived ease of use, perceived benefit and user behaviour as the independent variables, and the regression results are shown in the table below.

Table 12. Logistic Regression Results

	Unstandardised coefficient		Standardised coefficient	*t*	*p*
	B	standard errro	*Beta*		
Constant	6.014	0.913	-	6.585	0.000***
Perceived Ease of Use	0.001	0.036	0.001	0.022	0.983
User Behaviour	0.535	0.045	0.857	11.914	0.000***
Perceived Benefits	-0.486	0.052	-0.679	-9.356	0.000***

R^2	0.463
adjusted R^2	0.454
F	F (3,182)=52.340, p=0.000
D-W	2.227

Observe the regression results table, from which we can see that the coefficient of perceived ease of use is 0.001, but not significant; the coefficient of perceived benefit is 0.535, and observe the p-value to know that it is very significant; and the coefficient of user behaviour is -0.486, also very significant.

Table 13. Covariance Diagnostics

	VIF	tolerance level
Constant	-	-
Perceived Ease of Use	1.369	0.730
User Behaviour	1.755	0.570
Perceived Benefits	1.786	0.560

The regression model was tested for multiple covariance in the above table and it is evident that the VIF values in the model are all less than 5, which implies that there is no covariance problem and the D-W value is 2.227, which further indicates that there is no autocorrelation in the model and that the regression model is well fitted.

5. Discussion and Conclusion

5.1 Discussion

This research focused on examining two particular parts of the Technology Acceptance Model (TAM): the perceived ease of use of cryptocurrencies by consumers, and the perceived benefits of transaction processing, security and control, and decentralization. This research investigates the impact of several factors on the intended use behavior. Figure 1 displays the conceptual framework of the investigation and the predicted consequences of the assigned hypothesis. TAM is an acronym that represents the fundamental foundation on which the research and ideas were built. The questionnaire analysis revealed that participants' attitudes towards the use of cryptocurrencies are mostly positive. These results indicate that while consumers perceive cryptocurrencies to have advantages and be easy to use, they are nonetheless reluctant to use them as often as they want. The hypothesis results on the relationship between perceived benefits and use behavior, as well as between perceived ease of use and perceived benefits, were found to be different from those of Abramova and Böhme (2016). This may be attributed to the constraints imposed by the study's location and the limited sample size. The study's results challenged the Technology Acceptance Model (TAM) about the impact of usability on

advantages. While the Technology Acceptance Model (TAM) has shown to be effective in several contexts, it did not provide satisfactory results when applied to the specific case of bitcoin in this research.

5.2 Conclusion

The objective of this study was to investigate the impact of bitcoin use on users' behavior and their perception of the associated advantages. When formulating hypotheses based on the Technology Acceptance Model (TAM) in the context of cryptocurrencies, two particular criteria were considered: consumers' perceived ease of use and perceived advantages. Twenty-five bitcoin users participated in an online survey, providing information on their use habits, perceived advantages, and perceived ease of use. Through a series of empirical analyses, this paper explores the relationship between perceived ease of use, user behaviour and perceived benefits as well as their impact on cryptocurrencies. The findings show that perceived ease of use has a significant positive impact on perceived benefits, suggesting that the convenient experience that cryptocurrencies bring to users not only enhances their perceptions of the value of the technology, but also the benefits that cryptocurrencies bring. At the same time, perceived benefits also have a significant positive impact on user behaviour, although some inconveniences still exist. In addition, although perceived ease of use did not have a significant impact on user behaviour, users' perception of ease of use of cryptocurrencies increased with time of use. Through logistic regression, it can be learned that perceived benefits and user behaviour have a significant positive impact on cryptocurrencies, while the results of the impact of perceived ease of use may need to take more factors into account. Specifically, the greater the perceived benefit of using cryptocurrencies, the more likely users are to use cryptocurrency, and the greater the usage may be. Similarly, users' actual behaviour towards cryptocurrencies significantly contributes to the development and use of cryptocurrencies. However, from the empirical results perceived ease of use, although theoretically considered to be an important driver, did not show the expected significance in this study, which may be influenced by other factors that need to be further explored.

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