International Journal of Multidisciplinary Research and Growth Evaluation.

Exploring Barriers and Resistance in the Adoption of Cryptocurrency among Micro, Small, and Medium Enterprises MSMEs in Lusaka

Larry Mweetwa [1*], Austin Mwange [2]
[1] Doctor of Business Administration (DBA) Candidate, ZCAS University, School of Business, PO Box 50497 RW, Lusaka Zambia
[2] Lecturer, The University of Zambia, Graduate School of Business, P.O. Box 32379, Lusaka, Zambia

* Corresponding Author: **Larry Mweetwa**

Article Info

ISSN (online): 2582-7138
Volume: 04
Issue: 05
September-October 2023
Received: 03-09-2023;
Accepted: 21-09-2023
Page No: 684-697

Abstract
The aim of this article is to Explore Barriers and Resistance in the Adoption of Cryptocurrency among Micro, Small, and Medium Enterprises MSMEs in Zambia's capital city, Lusaka. When considering the benefits of innovation, one of the trickiest questions to answer is how quickly people will adopt new technologies. This article delves into what motivates and what holds back potential business entities in the MSMEs sector from making a transition to blockchain-based cryptocurrencies like bitcoin. Our findings are narrowly focused on these impediments to adoption, which we identify as Lack of regulatory support, risk of revealing personal data system complexity, lack of regulatory authority, trust deficit, and value speculation.

DOI: https://doi.org/10.54660/.IJMRGE.2023.4.5.684-697

Keywords: Bitcoin, cryptocurrency, cryptocurrency adoption, performance and effort expectancy, social influence, customer behaviour, Barriers to bitcoin adoption, MSMEs, Micro, Small, and Medium Enterprises

1. Introduction

The purpose of the Internet was originally to decentralise communication, and its first use case was the relatively straightforward one of email (digital communications). at a similar manner, the Blockchain was designed at the beginning to disseminate "value." The first use case of cryptocurrencies was Bitcoin. The number of use cases increased in tandem with the growth of the Internet. E-commerce, social networks, gaming, and many other activities were made easier thanks to the Internet. In a similar manner, the use cases for Blockchain technology have expanded beyond cryptocurrencies like Bitcoin and Litecoin, which receive a great deal of attention, and into other types of cryptoassets, such as cryptocommodities like Ethereum and cryptotokens like Steem. There will be an ongoing proliferation of new use cases, in addition to the emergence of additional markets, such as crypto-assets. As often mentioned the presence and spread of cryptocurrencies across the world's economies and jurisdictions and it acceptance will continue rising as technology advances. However, crypto adoption can relate to many various layers of viewpoint, whether one is taking a macro glance on an entire economy or merely expressing the acceptance of cryptocurrencies as a means of payment by businesses, with one layer naturally impacting the other. This is because one layer influences the other in a feedback loop. One type of crypto adoption would be if a company like Tesla announced that they would take Bitcoin as a form of payment. This may potentially lead to more people in that economy holding and trading cryptocurrencies. As an example, this would fall under the second category.

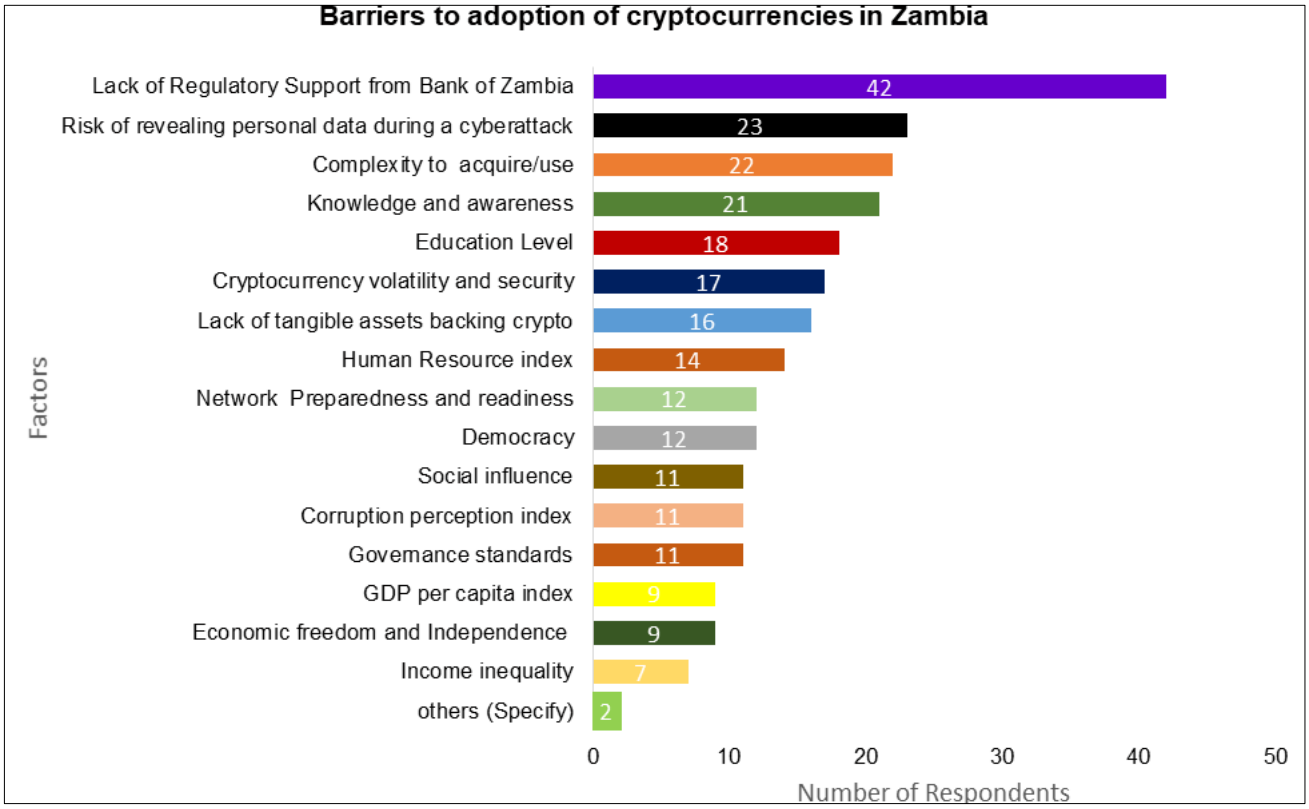
Cryptocurrencies employ cryptography to secure the transactions between buyers and sellers online. Distributed transaction verification in the absence of a trusted authority is necessary for this procedure. Verifying a transaction's details, such as its quantity and whether or not the payer actually possesses the currency being spent, helps prevent the double spending of funds. Mining is the term for this method of verification. Different cryptocurrencies utilise different mining methods because they have different purposes. Some cryptocurrencies, for instance, aim to limit the amount of transactions validated in a given time period, while others aim to provide rapid, lightweight services. Cryptocurrencies are now a widely used form of financial technology.

Mining is an essential aspect of these systems, which rely on a decentralised ledger for safe data storage. In order for users to obtain a safe, robust agreement for each transaction, mining adds records of previous transactions to the distributed ledger known as Blockchain. New wealth, in the form of currency, is also created by mining. Since cryptocurrencies were developed as decentralised peer-to-peer networks, there is no governing body to oversee financial dealings between users. Miners are used to verify trades. Mining cryptocurrencies should only be done using trustworthy software. In this article, we take a look barriers and resistance to adoption of cryptocurrency among MSMEs in Lusaka Zambia. Mining is critical in cryptocurrency. Each mining approach is assessed for its advantages, disadvantages, and potential risks. In this article we discus in broad terms several impediments and resistance to adoption of cryptocurrency. It's worth noting that certain mining algorithms are designed to be particularly memory or CPU taxing.

1.1 Materials and Methods

Google Forms, survey management software built with the free, web-based Google Docs Editors suite, was used to disseminate and collect primary data from both paper and digital versions of a Questionnaire survey. The study was conducted in Lusaka, Zambia, among 257 micro, small, and medium-sized enterprises (MSMEs), from January to May of 2023. The geographic scope was chosen for Lusaka in a by way of convenient sampling. In this study, demographic variables such as gender, age, industry, years of experience, and education level were taken into consideration. With 59% of the respondents being male and just 41% being female. The data on education was aggregated from non-education, primary education, secondary education, and tertiary education, with the phrase "tertiary education" indicating that the respondent had attended either a university or a higher professional school. The majority of the respondents had between 3 and 5 years of work experience, were over the age of 40, had tertiary education, and operated as general dealers when the data was being gathered. The IBM SPSS Statistics Version 24 and Excel was utilised in the process of performing the statistical analysis on the primary data that was gathered. When analysing the relationships between two variables, contingency table analyses were carried out. Within the scope of the study that will be discussed further down, the authors did not differentiate between the two primary classifications of cryptocurrencies, namely coins and tokens. All of them were categorised as cryptocurrencies collectively. The survey further description of demographic profile of respondents is given below in the results section.

1.2 Results and Discussion



The findings of this study are discussed in detail below in line with study aim and objectives.

Fig 1.1: Showing distribution of barriers to adoption of cryptocurrencies in Zambia

There are two important components required for the effective adoption of any technology: technology awareness and behavioural intent are critical vehicles to adoption of new technology. Figure 4.8 graph above represent and illustrates the wide range of barriers to the adoption of cryptocurrencies in Zambia. Several questions were presented to the respondents in order to assess and obtain a better understanding of the challenges or barriers that prohibit MSMEs in Zambia from adopting cryptocurrency. This was done in order to analyse and acquire a better understanding of the issues at hand. The information that was gathered showed that the majority of respondents were of the opinion that the Bank of Zambia did not provide enough regulatory support, which accounted for 16.34% (42/257) of the

respondents, followed by Income Inequality, which accounted for the least amount of respondents (2.7%) (7/257) and others (Specify), which accounted for the least amount of respondents (0.7%) (2/257).Then followed by Risk of revealing personal data during a cyber-attack accounting for 8.9% (23/257), Complexity to acquire/use accounting for 8.5% (22/257), Knowledge and awareness accounting for 8.2% (21/257), Education Level accounting for 7% (18/257), Cryptocurrency volatility and security accounting for 6.6% (17/257), Lack of tangible assets backing crypto accounting for 6.2% (16/257), Human Resource index accounting for 5.4% (14/257), Network Preparedness and readiness accounting for 4.7% (12/257), Democracy accounting for 4.7% (12/257), Social influence accounting for 4.2% (11/257), Corruption perception index accounting for 4.2% (11/257), Governance standards accounting for 4.2% (11/257), GDP per capita index accounting for 3.5% (9/257), Economic freedom and Independence accounting for 3.5% (9/257), Income inequality accounting for 2.7% (7/257) and Others (Specify) accounting for 0.7% (2/257).

Lack of Regulatory Support from Bank of Zambia as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

According to the findings of this research, one of the primary reasons why the majority of small and medium-sized enterprises (MSMEs) in Zambia have not implemented the digital currency is largely because of regulatory ambiguity, a lack of support, or an existing regulatory structure is crucial (Bank of Zambia 2018 statement: Bitcoin.com 2018). There is no law or regulation in Zambia that expressly prohibits or allows the use of cryptocurrencies, and the Bank of Zambia (BoZ) is aware that it does not have the authority or the legal grounding to shut down the emerging cryptocurrency sector in the southern African nation of Zambia. For the Bank of Zambia to be able to assert any kind of jurisdiction over the buying and selling of cryptocurrencies, the law that allowed for its foundation would first need to be amended by the parliament. However, in 2018, the Bank of Zambia (BoZ), which is the country's central bank, issued a cautionary statement to the public that cautioned them about potential risks associated with the usage of digital currencies. These concerns include the possible use of digital currencies for illicit activities such as money laundering and other offences. Additionally, the BoZ has declared that it does not recognise cryptocurrencies as legitimate forms of currency and that it does not monitor or control the usage of cryptocurrencies in any way. Because of this, the use of cryptocurrencies is not yet controlled by any official entity in Zambia, thus users should be aware of the dangers that are associated with their usage of cryptocurrencies. This effectively constitutes a prohibition on the use of cryptocurrencies inside the borders of the country. Despite this, however, there are attempts being undertaken to get Zambia to participate in the digital currency market. According to the Bank of Zambia, which was quoted by Bloomberg.com on 9th February, 2022, it was said that Zambia's central bank plans to complete research on the establishment of a digital currency by the fourth quarter of 2022, which may reduce the costs of transactions and enhance participation in the formal financial system. These findings are in agreement with those of who stated that where there is not a clear regulatory framework, it becomes difficult to enforce the adoption of cryptocurrencies. They also highlighted that enforcement is problematic with the poor regulatory framework, and that there is a greater need for collaboration between government agencies and developers to establish an ecosystem that integrates investor protection and investment. Additionally, our findings are in agreement with the findings of the checkout.com payment platform, which stated that, "Consumers being able to pay for products and services with crypto is seen by many in the industry as a path to wider acceptance of digital currencies, however lack of regulatory support is a major barrier." In other words, the ability of consumers to pay for products and services with cryptocurrency is seen as a path to wider acceptance of digital currencies, However, according to a research that was given at the conference by cloud- based payments platform Checkout.com, regulatory uncertainty is one of the primary reasons why more merchants are not adopting cryptocurrency as a payment option. The analysis, which was based on a survey of 3,000 enterprises in 10 different countries, the majority of which were involved in online marketplaces, financial technology, and e-commerce, said that regulatory uncertainty will continue for the foreseeable future since the development of national legislative frameworks for regulating cryptocurrencies has been rather sluggish and unequal (The wall street Journal 2023).

There are several compelling arguments in favour of regulating cryptocurrencies. One of the most important reasons is to shield customers from scams and other types of illegal financial activities. Scams and other forms of illegal behaviour have been able to take advantage of the cryptocurrency market since it is a relatively new asset class that is mostly unregulated. Regulators have the ability to assist limit the risk associated with activities like the usage and exchange of cryptocurrencies and prevent consumers from experiencing financial loss if they create rules and standards for such activities.

One further argument in favour of regulating cryptocurrencies is that it will help the market for cryptocurrencies become more reliable and stable. The values of cryptocurrencies are notoriously unstable, and major price shifts may occur in very short amounts of time. Due to the complexities involved, investing in them may be dangerous for investors, and it can be difficult for companies to accept them as a form of payment. The government has the ability to assist minimise volatility and encourage better trust in the use of cryptocurrencies as a medium of trade if they regulate the cryptocurrencies.

The regulation of cryptocurrencies has the potential to guarantee that they are utilised in a manner that is congruent with the larger financial and economic regulations that are in place. This covers concerns like as complying with tax laws and combating the laundering of money and funding of terrorist organisations. The authorities may assist guarantee that cryptocurrencies are not used for illegal purposes and that they are incorporated into the larger financial system in a manner that is advantageous to all stakeholders by creating regulations for the use of cryptocurrencies and ensuring that they are utilised in accordance with those laws.

In conclusion of this barrier factor, the protection of consumers is an essential aspect to take into account when it comes to the regulation of cryptocurrencies. This aspect necessitates the combination of stringent legislation and robust business practises in order to avoid monetary losses and other hazards. It is in the Bank of Zambia's unique position to establish a global standard for cryptocurrency regulation and to educate governments across the globe on

the basic ideas that must underpin their cryptocurrency regulatory frameworks in order to transform cryptocurrencies into legal money. This opportunity should be a chance not to be missed and the Bank of Zambia should seize prospect.

Risk of revealing personal data during a cyber-attack as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

The respondents in our study identified the risk of revealing personal data during a cyber-attack as a barrier to the adoption of cryptocurrencies among MSMEs in Zambia. This was one of the barriers that was brought to light as a result of our research. Our findings are in line with those of Kaspersky 2022, who found that one of the concerns mentioned in hesitance to use cryptocurrencies as a legal money was the danger of disclosing personal data during a hack (reported by 6% of respondents). Based on these data, it seems that stability and security are two of the most important concerns about the widespread use of cryptocurrencies. In point of fact, one responder out of every eight does not trust crypto at all anymore. Over the course of the last several decades, information technology (IT) has evolved into an essential component of well-functioning economies and has been a driving force behind economic expansion. Companies of all sizes, in both the public and private sectors, are growing more dependent on products and services offered by the information technology industry, such as cloud-based information management systems and artificial intelligence. As a consequence of this, there is a rising vulnerability to cyber potential hazards. Cyber risk, also known as a threat of financial loss, disruption, or reputational harm to a business as a consequence of the breakdown of its information technology systems, is a popular definition of cyber risk. These occurrences consist of malevolent cyber incidents, often known as cyber-attacks, in which the threat actor seeks to do damage. (e.g. ransomware attacks, hacking incidents or data theft by employees).

Companies take proactive measures to control cyber risk and make investments in cyber security. However, it is impossible to measure the costs of cybercrime. Cyber risks are a crucial "known unknown" tail risk to the system in the financial sector, and they pose a potentially significant danger to the industry's overall financial stability. In a broader sense, the potential for cyber risk in businesses that perform essential functions in the nation's economic infrastructure to have systemic ramifications warrants consideration as an issue of national security. In spite of the fact that such implications are acknowledged, there is a paucity of evidence about the costs, causes, and possible mitigating variables of cyber disasters. The conclusions of this research are very important for a change in policy and the necessity for implementation in cyber security in the financial industry, particularly in digital or cryptocurrency. Our findings resonates very well with one of our identified Perceived risk theory which states that risk is a multidimensional concept, containing components, each with attached influence on consumer's overall perceived risk, that vary across persons hence respondents who were surveyed had a good reason to express such a view towards cryptocurrency as medium of legal tender among MSMEs in Zambia.

Complexity to acquire/use as a barrier to adoption of cryptocurrency among MSMEs in Zambia

The respondents cited the complexity of acquiring and using cryptocurrencies as one of the main barriers standing in the way of widespread adoption of the digital currency technology. Respondents highlighted the fact that online platforms for digital currencies are complicated to use, and very little awareness or efforts have been made by financial and regulatory agencies in advocating awareness and user ability of these platforms. One has to concentrate on a great deal of text and numbers for extended periods of time, to be able to use more complex platforms such as Bitcoin, Ripple, and Litecoin, among others. The user interfaces of the digital currency platforms themselves are daunting to all but the most technically knowledgeable users. This means that it is not cryptocurrencies itself that is too complex for people to grasp; rather, it is the user interfaces of the currency platforms themselves.

To reach its audience, the digital currency must, first and foremost, overcome the barriers to entry that are often associated with the introduction of new technology. Product complexity may be characterized in a variety of ways, but the easiest way to think about it is as the amount of distinct elements or features that comprise an easy-to-use product for the customer, such as cryptocurrencies. It is necessary to evaluate all parts of a product when deciding what "product complexity" means for a particular company. These factors include how the product performs, how it is made and built, how it is promoted and sold, and how the end user will find it less complicated to use. A product's level of complexity may also be affected by aspects such as its physical size, the degree to which it can be integrated with preexisting systems, the needs for technical assistance, and the extent to which it can be customised. It takes more time and resources to design, develop, test, and produce a product, and for that product to be accepted by the general public, therefore, it is critical for such a product to achieve its intended goal or fit for purpose. When developing their products, businesses have a responsibility to take into account all of these complexity in order to give consumers the best possible user experience while still meeting all of their functional requirements. When developing a product, the designers of that product need to carefully assess each feature they include to decide whether or not it provides extra value or just increases the complexity of the product without providing any discernible advantage to the customers, as is the case with digital money. When selling a complicated product to the end customer, the sales process may often be time- consuming, tedious, and overwhelming. There is potential for both good and negative effects on the sales process brought on by the complex nature of the product. The more functions a product has or the more customization possibilities it provides for buyers, the more complicated it is. When similar items are offered with varying degrees of customisation or extra services that need to be taken into consideration when making a sale, complexity will also rise as a result of these factors. When there is a greater level of complexity, it will take longer for clients to make an educated choice about their decision to purchase or use such a product, and sales staff will need more thorough training in order to be able to provide a successful

sales proposal. The disadvantage of selling a complex product is that it requires salespeople to have specialised knowledge in order to effectively explain how all of the components work together and describe how customers will benefit from their purchase. Cryptocurrency platforms are not exceptional or immune to this barrier to entry risk; however, they do present their own unique challenges.

Consumers may put off making a purchase choice until they are certain about what they want or need from the product (digital currency platform usability), and more particularly cryptocurrency, since it will take them longer to comprehend the value proposition of a product that is more complicated. This may cause consumers to hold off on purchasing cryptocurrency. In addition, if the customer's demands aren't addressed at each point of their excursion, they may decide against acquiring a complicated product entirely, which is particularly likely if they have a limited understanding of the technical features of the product before they begin their journey.

Therefore, offering extensive information about each component portion (and associated services) before commencing the sales process enables businesses to take advantage on client curiosity while simultaneously creating confidence in the product. This is especially true in the case of cryptocurrency platforms. The results of the poll on how difficult it is to acquire or make use of anything have a lot in common with two of the theories that we have identified: the Technology Acceptance Theory and the Diffusion of Innovation Theory.

Knowledge and awareness as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

Knowledge and awareness were cited by respondents as an additional barrier to the adoption of cryptocurrencies among micro, small, and medium-sized enterprises in Zambia. These findings validate the findings of a great deal of the earlier work in cointelegraph.com survey of May 27th May 2021, which discovered that in the results of their survey, 51% of respondents said that a lack of awareness is the primary obstacle to the adoption of open-source cryptocurrencies like Bitcoin and Ether (ETH), etc. Furthermore Rejeb, A., *et al* 2022 also identified knowledge and awareness as a potential barrier to blockchain adoption in the circular economy. These findings verify the findings of a great deal of the earlier work in. According to the findings of a recent poll, the most significant barrier to broader acceptance of cryptocurrencies like Bitcoin is a lack of awareness and comprehension about crypto which was also cited by. This is one of the numerous challenges involved with cryptocurrencies like Bitcoin. A new study titled" was just published by the research and analytical part of the Economist Group, which is known as the Economist Intelligence Unit. The consumer survey consisted of 3,053 participants and was carried out between February and March of 2021. The research was commissioned by Crypto.com, a prominent payment and cryptocurrency platform, and it was published in this report.

Too often businesses introduce a fantastic product with the sole intention of focusing on certain phases of the product adoption process, such as luring customers to sign up for a trial or orienting them to their app. They are therefore taken aback when consumers stop engaging with their content or do not convert. To get people to see the value of your product and adopt it, we need to take a step back and look at the broad picture and grasp what is involved in each stage of the adoption process. This is particularly important when it comes to cryptocurrencies and the platforms that support it. When it comes to introducing new items to their customer base, businesses often confront resistance. It is essential to have an understanding of the many phases of adoption, as well as the strategies, tools, and procedures that may be utilised to move consumers through each step, in order to maximise the likelihood of success. Awareness, interest, evaluation, trial, activation, and adoption are the six steps that make up the process of product adoption. Users are able to skip phases of a product's adoption process, therefore the process is not necessarily linear. There are also five different characteristics of people who embrace new technologies: innovators, early adopters, early majority, late majority, and laggards. We need to have a good understanding of these profiles since different people have various requirements and progress through the phases of product adoption at varying rates. This is especially important when it comes to the adoption of cryptocurrencies.

For instance, a company may launch a cryptocurrency, and a tech-savvy early adopter would be fast to download a software product trial after doing just the bare minimum of research. However, a late adopter who is more risk adverse may go back and forth between phases as they learn more about your product and how it might help them address their issues. Therefore, it is necessary to optimise the tactics pertaining to content, support, onboarding, and product uptake appropriately. These findings suggest that there is an association between the views expressed here by our respondents in regard to knowledge and awareness in that it resonates well with Roger's diffusion of Innovation (DOI) Theory. The Roger's diffusion of Innovation (DOI) Theory was developed by E.M. Rogers in 1962 and is one of the oldest theories in the field of social science. It was initially used in the area of communication to explain how, over the course of some length of time, an idea or product develops momentum and diffuses (or spreads) within a given population or social system. Specifically, the term "diffusion" referred to the process by which an idea or product moves from one person to another within a social system. This idea is relevant to the use of cryptocurrencies by micro, small, and medium-sized enterprises (MSMEs) in Zambia.

Education Level as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

The respondents in this survey identified the level of education attained as a significant factor in the adoption of cryptocurrencies. Our results align with those of, who claimed that countries with greater education level attainment may be anticipated to embrace cryptocurrency more quickly in the light of the existence of technical skills and knowledge. Our findings also align with those of. In a similar vein, the effect of the deployment of cryptocurrencies in undeveloped countries might be exceedingly large depending on the amount of capabilities present.

Financial literacy and educational attainment may boost the knowledge of cryptocurrency- based systems, including the broader deployment of blockchains, and the use of cryptocurrencies can open up possibilities for the use of smart contracts. These possibilities can be opened up by the use of cryptocurrencies. In addition, many professionals in the cryptocurrency industry have reasonable good level of education in order to understand issues surrounding software development and use complemented by understanding computer engineering, computer science, information security, web development, artificial intelligence, and other fields that are closely connected. One need to educate themselves about the market and how currency exchanges operate in order to make the best possible decisions while trading. With the proper knowledge, you will be able to formulate the most effective trading strategies. Additionally, if you educate yourself on the cryptocurrency market, you may protect yourself from potential risks that are avoidable.

Cryptocurrency volatility and security as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

A good number of respondents in the survey also highlighted that Cryptocurrency volatility and security were among some of the barriers to adoption of cryptocurrency as a legal tender among MSMEs in Zambia. The degree to which the price of a certain asset has increased or decreased over a given period of time is referred to as that asset's volatility. The price of bitcoin is volatile because it is impacted by supply and demand, the feelings of investors and users, the regulations of governments, and the anticipation generated by the media. The fluctuation in prices is a direct result of the interaction of all of these elements. The high degree of volatility in the dynamics of the price movements of cryptocurrencies may be attributed to the speculative behaviour that exists in the market. A model that is able to properly explain the daily volatility, which is accounted for in terms of variance between the high and low price realised over a day, is also suitable to anticipate the intraday return, and this information is crucial for the speculators who are involved in the market. In recent times, cryptocurrency has been the topic of conversation around the globe and in the financial markets. Since its inception in 2008 by an unknown individual going by the name Satoshi Nakamoto, digital currencies are assets that can be traded and have received a great deal of attention in recent years from the general public as well as financial institutions, regulators, and investors. A significant number of studies have investigated the practicability of using cryptocurrencies in lieu of traditional currencies Cryptographic forms of money are distinguished from fiat money by three main characteristics (Wang, G., *et al* 2019). While digital currencies are the development of fiat monetary forms and are used for online trades and worldwide exchanges, cryptographic forms of money are not backed by a central bank. To begin, they do not possess any focal power, and as a consequence, it is believed that they are immune to the impediment and control of the government because of this. As a result, using them is an acceptable alternative choice, especially in countries whose monetary forms are uncertain and whose economies are unstable. The sophisticated nature of digital currencies and cryptocurrencies makes it possible for them to be used and transferred without difficulty across international boundaries. In response to the extreme volatility of cryptocurrencies, financial experts have devised a model that might mitigate the associated risks respect to volatility. The technical indication for the price and volatility of a crypto asset over time is called the Bollinger bands. They get their name from John Bollinger, the technical trader who invented them and is credited with their creation. They are made up of three primary components: the simple moving average (often the SMA calculated over a period of 20 periods), an upper band, and a lower band that is typically two standard deviations apart from the SMA. The distance that a set of values or prices deviates from their mean is what is measured by a statistic known as the standard deviation.

For example, if prices are trading inside a small range (which suggests short-term consolidation), the standard deviation will yield a low number, which indicates little volatility. Because of this, the standard deviation is a useful measure of volatility. The positive standard deviation is represented by the upper band of the Bollinger distribution. This region reveals that the underlying price is increasing in a manner that is not typical, and it is a strong signal that it may be overbought.

The lower Bollinger band illustrates the standard deviation that is heading in the wrong direction. This region demonstrates that the underlying price is decreasing in a manner that is not typical, and it is a strong indicator that it may have been oversold. As the bands widen, it is clear that the market is getting more volatile as prices move farther away from the 20-day moving average (MA). It's possible that when bands break apart, the market will become less volatile. The Cryptocurrency Volatility Index, often known as the CVI index, was developed in response to growing interest in the topic of measuring the volatile nature of the cryptocurrency market. The Black-Scholes option pricing model is used to determine this, and it is a measurement of the degree to which the price of the whole cryptocurrency market is expected to fluctuate in the next 30 days. In this manner, an index that ranges from 0 to 200 are established (Gopane, T.J., 2021). This index is designed in such a way that a value of 200 will represent the highest degree of implied volatility in the market, whilst a value of zero would show the lowest level of volatility. This index was developed with the goal of preventing investors from exposing themselves to unnecessary risk by adjusting their trading strategy in accordance with varying values of the CVI. The higher the CVI value, the bigger the possible return, but also the greater the risks that are involved.

Lack of tangible assets backing crypto as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

Lack of tangible assets backing crypto as a barrier to adoption of cryptocurrency is one of the major impeding factors identified by respondents to acceptance and usage of cryptocurrency among MSMEs in Zambia. Any commodity that can be touched and held in one's hands is referred to as a tangible asset. Inventory, a structure, automobiles,

manufacturing equipment or machinery, office furniture, and other types of office furnishings are some examples of a tangible asset. Inventory and fixed assets are the two categories that fall under the category of physical assets. Tokens that have their value directly related to a physical real-world item are known as asset-backed tokens. This makes the value of asset-backed tokens less speculative and volatile than the value of standard cryptocurrencies. Tokens that are backed by real-world assets may be backed by gold, real estate, art, technology, or almost any other real-world item of comparable value. The immaterial nature of digital currencies presents a significant obstacle for their use. Today, cryptocurrencies like Bitcoin and Ethereum are recorded as intangible assets on a company's balance sheet and their past prices are used to determine their value. When the price falls by a significant amount, such assets are evaluated as having an impaired value, and when the price recovers, the loss associated with those assets cannot be recovered in the financial reports. Because cryptocurrency assets may be exchanged on an exchange, it is reasonable to anticipate that the entity will enjoy an influx of economic advantages as a result of the cryptocurrency trading. The value of cryptocurrencies, on the other hand, is very volatile, and as a result, it cannot be considered a stable kind of money. The term "cryptocurrency" refers to a kind of digital currency that is devoid of any actual substance. As a result, the intangible asset categorization is the one that fits the situation the best. When using the cost model to value assets, intangible assets are initially valued at their full cost at first recognition. Subsequently, they are valued at their full cost minus any accrued amortisation and impairment losses. Intangible assets may be held at a revalued amount if there is an active market for them, according to the revaluation model. However, this may not be the case for all cryptocurrencies. It is best practise to use the same measurement model to each asset that belongs to the same asset class. If there are assets in a class of assets that are assessed using the revaluation model but there is no active market for those assets, then those assets should be measured using the cost model rather than the revaluation model.

Human Resource index as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

The Human Resource index was cited by respondents who took part in this study as a barrier to adoption of the digital currency among micro, small, and medium-sized enterprises (MSMEs) in Zambia. The Human Capital Index (HCI) attempts to put a numerical value on the effect that factors such as health and education have on the output of the next generation of employees. Countries are using it to determine the amount of lost revenue that may be attributed to deficiencies in their human capital, as well as the rate at which these losses can be turned into profits. Life expectancy, educational attainment, and income per capita are the three components that go into calculating the human development index. Several ways exist which directs flow of information, communication, and technology have the potential to contribute to human development in sub-Saharan Africa. It has been shown that advances in technology play a part in the empowerment of women in the provision of access to healthcare and the management of identities these as critical for business operation.

Network Preparedness and readiness as a barrier to adoption of cryptocurrency among MSMEs in Zambia as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

The participants in this poll who provided their feedback emphasized The Network Readiness Index which evaluates a nation based on its capacity to benefit from the opportunities presented by advances in information communication and technology. There is still a problem that has to be addressed in the market for digital currencies, and that problem is granting permissions and transactions. Even if the problem of controlling ownership may be solved, there is still another problem that needs to be handled. At this point, the dispersed network is brought into play. It does this by using a variety of mathematical procedures, which guarantee that all transactions are checked and legal. Cryptocurrency technologies are dependent on the size of the network since the network's size is an essential factor in determining its level of safety.

Since its inception, the capacity of the Bitcoin blockchain has been steadily increasing, to the point where the statistics that are now being speculated about are more than 3,550,000 TH/s. To put this into perspective, imagine the digital capability of over ten thousand corporate websites belonging to the world's largest organizations. Network readiness is a measurement of the preparation of an economy in relation to the existence of infrastructure and skills necessary for the adoption of technology. This readiness is strongly related to the adoption of cryptocurrencies. It might give directions for collaboration and promotion of ICT (Information and Communication Technology) development to policy makers and ICT (Information and Communication Technology) stakeholders. Therefore in order for a nation to most profit from the digital currency platform, a strong network readiness is required to encourage adoption of the blockchain market, this also falls under the Technology acceptance theory.

Democracy as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

The participants in this poll underlined the idea that democracy is believed to lessen digital gap by stimulating innovation and quick technological adoption. Through decentralised voting, identity management, electronic governance, and electronic democratic processes, blockchain-based solutions provide people greater power by levelling the playing field in terms of information asymmetry. According to the findings, the price volatility and returns of Bitcoin are, respectively, favourably and adversely associated to geopolitical concerns. They argue that Bitcoin might be used as a hedge against the geopolitical threats that are out there. In addition, since cryptocurrencies cannot be duplicated, they are the ideal answer to the issues of decentralisation and weak governance that plague many democracies.

Decentralization, on the other hand, requires either faith in the local government or a rigorous mechanism that eliminates the possibility of theft. As a result of the fact that cryptocurrencies provide solutions to these issues, their adoption by democratic nations is not only more probable but also helps democratic nations become even stronger.

Social influence as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

The respondents who took part in this study identified social influence as one of the factors that might prevent widespread use of cryptocurrencies. The ways in which people modify their behaviour in order to conform to the expectations of their social surroundings are examples of social influence. It may manifest itself in a variety of ways, such as via conformity, socialization, peer pressure, obedience, leadership, persuasion, sales, and marketing. These are just few of the examples. In most cases, social influence is the consequence of a particular action, demand, or request; but, individuals are also known to change their attitudes and behaviours in reaction to what they believe others may do or think. The notion of social influence proposes that individuals are significantly influenced by the ideas and behaviours shown by others around them. The application of this idea is most common in the fields of persuasion, influencing large groups of people, or influencing behaviour over an extended period of time. People are susceptible to being persuaded, either positively or negatively, to embrace cryptocurrency based on what they hear about it.

Corruption perception index as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

The Corruption Perceptions index (CPI) is an indicator that rates nations "by their perceived levels of public sector corruption, as determined by expert assessments and opinion surveys." The CPI was created in 2005. In general, the definition of corruption offered by the CPI is "the abuse of entrusted power for private gain." A variety of definitions and taxonomies may be applied to the concept of corruption. The most prevalent forms or classifications of corruption include supply and demand corruption, grand and petty corruption, conventional and unorthodox forms of corruption, and public and private forms of corruption.

Digital currencies are not immune to corruption problems. Criminals are often among of the first people to use any breakthrough technology that is shown to be effective. According to Jason Weinstein's research from 2019, blockchains have the potential to become yet another example of how criminals exploit new technology to perform old crimes. In this respect, since the introduction of cryptocurrencies, a sufficient number of occurrences have arisen, and they are not only counted among the most high-profile cases of fraud, but have also shown themselves as instances of corruption and other types of illegal behavior, including the following:

"BitConnect": In 2018, the Indian authorities arrested Divyesh Darji, the owner of BitConnect. Darji is suspected of using a "Ponzi Scheme" to steal $12.6 billion (880 billion Indian Rupees) from Indian investors.

"Crypto Queen": In June of 2016, a businesswoman by the name of Dr. Ruja Ignatova, who was 36 years old at the time, stepped on stage at Wembley Arena (London) in front of thousands of people. She said to the applauding throng that "OneCoin" was well on its way to become the most prominent cryptocurrency in the world "for everyone to make payments everywhere."

People from every corner of the globe were already putting their money into something called "OneCoin," in the hopes of becoming a part of this new revolution. About the period of time from August 2014 to March 2017, about four billion euros were invested in dozens of different nations. In 2017, the so-called "crypto queen" just vanished along with all of these assets.

The "Bitclup network" refers to: The United States Attorney for the District of New Jersey, Craig Carpenito, made the announcement in 2019 that three individuals had been apprehended in connection with a cryptocurrency mining operation that had resulted in the theft of $722 million from investors. As a result of the roles that they played in "BitClub Network," the defendants Goettsche, Balaci, and Weeks *et al*. have been charged with conspiracy to engage in wire fraud. According to the United States Attorneys for the District of New Jersey in 2020, the "BitClub Network" was a fraudulent scheme that operated from April 2014 through December 2019, during which time it solicited financial contributions from investors in exchange for purported shares in cryptocurrency mining pools and rewarded investors for recruiting new investors into the scheme.

Governance standards as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

For a long time, there has been much discussion over the use of e-governance as a means of enhancing the governance systems via enhanced openness, the elimination of information asymmetry, the reduction of delays, and the protection against data theft. The advantages provided by bitcoin, such as immutable record keeping, decentralization, and the removal of the need for middlemen, make it an innovative and cutting-edge solution for fighting corruption in governance systems. Studies are now being carried out in order to evaluate the advantages of cryptocurrencies in addition to those of digital currencies issued by central banks in order to combat concerns relating to the misappropriation of money and illegal activities, particularly in developing countries. Efficiency in government has been shown to speed up the adoption of new technologies by reducing the costs of manufacturing, the uncertainty caused by corruption, and the lack of protection for property rights. From the vantage point of organisational theory, explores the consequences that corruption has on creative activity. In this respect, a company will either create new technology or adapt existing technology based on the simplicity of the options that are offered. In the case of bitcoin, because it offers an audit record and nearly completely eliminates the possibility of counterfeiting, shady middlemen may see it as a threat and try to dissuade CA from using it.

It is possible that cryptocurrencies may become widely used as a means of alleviating poverty in emerging nations, where

corruption is a key contributor to the widespread lack of economic opportunity. According to the findings of Resnick's (2020) research on the tax compliance behaviour of informal workers, compliance levels are shown to be greater when there is a shorter distance to travel between the tax collector and the tax payer. Cryptocurrency, which does away with the need for middlemen and provides a greater degree of confidence inside the system, may be used to accomplish this goal. On the other hand, it has been argued that in well-governed states, the cost of replacing already established systems can exceed any benefits realised. As a result, poorly governed states may make a rapid shift to adopt cryptocurrency in order to address issues relating to legitimate transactions and to enhance transparency. Some rising economies may place a high premium on fighting corruption as a means of easing the burdens it places on international trade, economic growth, and the acceptance of foreign help.

GDP per capita index as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

The correlation between Cryptocurrency and Gross Domestic Product demonstrates that the cryptocurrency industry has a drag on economic expansion. Labor and Capital, which are employed as the control variables in this study, both exhibit a positive significant result indicating that they have effects on GDP. In the meanwhile, there are certain detrimental effects that technology has on GDP. According to the growth principle, the transformation of technology leads to a rise in GDP. This occurs because an increase in GDP per capita encourages individuals to save money and make investments provide more evidence in support of this thesis by demonstrating that the degree of economic development in a nation is a significant factor in determining the pace of adoption of technology in its early stages of life cycle. Even if technological advancement is one of the primary factors that determines economic development, a country's GDP per capita is still an important one. Due to the high initial implementation costs and investments in research and development of blockchain-based applications including cryptocurrency, developing countries are more likely to prioritise the basic needs of their populations over the adoption of new technologies, despite the fact that the majority of these countries are deeply in debt, experience high inflation, and have a low GDP. According to, the pay of cryptocurrency developers and network engineers are high since the talents required to work with cryptocurrencies are still very uncommon. It is possible for organisations to be put in the position of having to hire staff members, including compliance and legal people, who are knowledgeable about the technology and are able to collaborate effectively with system developers and financial regulators.

Consuming a lot of energy is another expense associated with the installation. The Digiconomist's Bitcoin Energy Consumption Index indicated that it needs 1544 kWh of energy to perform a single Bitcoin transaction. Proof-of-work cryptocurrencies require an enormous amount of energy to function. This is a challenge for CA, especially in poor nations that have access to energy sources that are expensive.

Economic freedom and Independence as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

Individuals enjoy economic freedom when the property they obtain without the use of force, fraud, or theft is protected against physical invasions by other people and when they are free to use, trade, or give away their property as long as their activities do not infringe the similar rights of others.

Among these concerns is a diminishing faith in the legitimacy of the government, as well as uncertainty about traditional forms of currency and financial institutions. In addition, the findings demonstrated that consumers are drawn to cryptocurrencies by pull factors such as the perceived simplicity of usage, the perceived utility, and alternative investing techniques. An index of economic freedom compares different jurisdictions based on a variety of criteria, including the ease with which goods and services may be traded, the level of taxation, and the quality of the legal system. These aspects may be given points based on how much of an impact they have on the level of economic liberty, and then that information can be gathered into a single score that can be ranked. The ranking may be done on a country-by-country basis, may examine larger areas, or may focus on smaller subnational entities such as states. A composite measurement of the quality of political and economic institutions across a variety of jurisdictions, an index of economic freedom is a measure of how economically free a country is.

Scores and rankings in an index are determined by criteria that the developers of the index consider to be meaningful. These criteria might differ from index to index. These indexes are based on the observation that economies that are more based on free markets tend to experience greater levels of investment, more rapid growth, and higher average incomes, as well as increased levels of adoption of new technologies such as cryptocurrency due to political-economics acting as a mediating variable. This observation provides the impetus for these indexes.

Investors may use the index of economic freedom as a rapid method to track the developments in countries where they are interested in exposure, and they can also use it as a moderating variable for the easy adoption of cryptocurrencies.

Income inequality as a barrier to adoption of cryptocurrency among MSMEs in Zambia.

Inequality in terms of income refers to the manner in which a population's income is allocated unequally. The income gap widens when unequal distribution brings to greater disparities in pay. Disparity of wealth, often known as an unequal distribution of wealth, frequently occurs hand in hand with income disparity. It is possible to subdivide populations in a variety of ways to illustrate a range of various degrees and types of income disparity, such as income inequality based on gender or race. A population's degree of income inequality may be analysed using a variety of metrics, including the Gini coefficient, which is one of many possible approaches. According to, the cost of adopting new technologies and other complimentary variables, such as human capital, have contributed to a slower rate of technology adoption in developing countries as compared to industrialised nations.

The technology has the potential to provide employment opportunities for those with technical backgrounds while at the same time destroying other professions, which would exacerbate existing social and financial disparities.

Analyzing the contrary of the causality that was evaluated in this article, technological progress may also lower income inequality in the sense that it enables numerous start-up firms like to be formed. This is the opposite of the causation that was evaluated in this research. The disparity in incomes may have a cause-and-effect relationship on cryptocurrencies, which can then lead to the use of blockchain technology. It may encourage nations with high levels of inequality to embrace cryptocurrency as a means of addressing the amount of inequality that already exists. In certain countries, the adoption of cryptocurrency is considered as enabling higher financial involvement by the poor because of its reduced transaction costs, improved financial inclusion, and enhanced property rights security. In addition, there are several difficulties relating to economic inequality. It's possible that cryptocurrencies may lead to more economic engagement since everyone with a smartphone and internet access can take part in the economy of the whole world. Micro lending applications based on blockchain technology that have been implemented

in Southeast Asia have made it possible for 1.7 billion individuals across the globe who do not have bank accounts to establish a credit history that can be verified. (Carter, 2020) The Venezuelan government has begun issuing a digital currency that it developed in order to aid its residents in being sheltered from the depreciation of the country's fiat currency.

2. Conclusion

Since the first bitcoin was generated in 2009, it has been the most popular cryptocurrency in circulation since it was the first to leverage blockchain technology. At least 919 other cryptocurrencies and tokens are now trading on unregulated or registered exchanges since Bitcoin's genesis block. Some tax authorities treat the entire category of cryptocurrencies and tokens as if it were a commodity. Understanding key barriers in details as demonstrated in this article is critical to influence policy shift in financial regulation of any given country.

2. Theoretical implication

This study's main goal or aim was to determine the predictors or factors that influence micro and small medium enterprises in the adoption/acceptance of cryptocurrencies usage in Lusaka Zambia. In doing so, it will enable present and potential market participants to analyse the fundamental features of the cryptocurrency. This elucidates the role that perceived considerations (such as utility, convenience of use, and risk) play in bridging the gap between technological awareness and behavioural intentions. In this manner, it contributes to the body of knowledge that already exists concerning the factors that might be used to anticipate the adoption of digital currency. In addition, it underlines the intervening function of government assistance through a moderated mediation model, which can assist the sector in better comprehending the significance of legal rules and government support in increasing the behavioural intents of users. Both in the present and in the future.

2.1 Practical Implications

This current study has advanced new knowledge to the Banking sector, real estate, online wholesale and retail etc. and suggests that the main factors driving the adoption decision revealed from the study are the investment opportunity cryptocurrency brings about as well as the freedom of the anonymity of the transactions and privacy, the acceptance by business. Previous studies only looked at a single unit of cryptocurrency impact such as Taxation Compliance or regulation. But a more practical attention that is urgent is to review financial regulatory statutes that are at variance or impede cryptocurrency adoption in Zambia. These statutes include the Bank of Zambia Act No. 5 of 2022, which needs to be realigned and respond to global financial innovativeness; the National Financial Inclusion Strategy (2017–2022), which also needs to be realigned; The Public Finance Management ACT 2018, which also needs to be realigned; and the Money Laundering Act No. 14 of 2001.

3. Limitations of the Study

The fact that this study only surveyed MSMEs located in Lusaka is a significant limitation of the study's respondent population because Lusaka is an urban area and may have led to capturing data to respondents who were well-informed, which may have led to results being skewed. Consideration should be given to using a combination of qualitative and quantitative research approaches for future studies, the sample size was not sufficient; hence, future research could benefit from a larger sample size in order to generalise the findings. Randomization of future study populations should be considered rather than purposeful or convenient sampling. In addition, our ability to draw causal conclusions is hindered by the cross-sectional design, which leads us to believe that prospective studies would be strengthened by adopting a longitudinal methodology while bearing in mind that there may be individual differences in adoption process.

4. Conclusion

The major drivers were technological awareness, education, facilitating business environment, behavioral intent, social media, performance and effort expectancy. The aforementioned findings contribute to The Unified Theory of Acceptance and Use of Technology (UTAUT), which investigates the acceptance of technology, which is determined by the effects of performance expectancy, effort expectancy, social influence, and facilitating conditions in which respondents perceived appropriate adoption (AD) practices act as the catalyst to adopt or not to use cryptocurrency.

5. References

1. Abbad MM. Using the UTAUT model to understand students' usage of e-learning systems in developing countries. Education and Information Technologies. 2021; 26(6):7205-7224.
2. Abdullah SM. Similiarity Artikel: Social Cognitive Theory: A Bandura Thought Review published in 1982-2012. Journal Psikodimensia. 2019;18(1):85-100.
3. Acampora A, Lucchetti MC, Merli R, Ali F. The theoretical development and research methodology in green hotels research: A systematic literature review. Journal of Hospitality and Tourism Management. 2022;51:512-528.
4. Adam AM. A study on sample size determination in survey research. New Ideas Concerning Science and Technology. 2021;4:125-134.

5. Ambong RMA, Paulino MA. Analyzing rice farmers' intention to adopt modern rice technologies using technology acceptance model (TAM). Asian Research Journal of Agriculture. 2020;13(1):21-30.
6. Amores-Sesar I, Cachin C, Mićić J. Security analysis of ripple consensus. arXiv preprint arXiv:2011.14816; c2020.
7. Ante L. The non-fungible token (NFT) market and its relationship with Bitcoin and Ethereum. FinTech. 2022;1(3):216-224.
8. Ante L. Cryptocurrencies. In: The Emerald Handbook on Cryptoassets: Investment Opportunities and Challenges. Emerald Publishing Limited; c2023. p. 45-60.
9. Antonopoulos AM. Mastering Bitcoin: Programming the Open Blockchain. O'Reilly Media, Inc; c2017.
10. Antonopoulos AM. Mastering Bitcoin. O'Reilly Media; c2019.
11. Arias MA, Shin Y. There are two sides to every coin—even to the bitcoin, a virtual currency. The Regional Economis; c2013.
12. Arias-Oliva M, Pelegrín-Borondo J, Matías-Clavero G. Variables influencing cryptocurrency use: a technology acceptance model in Spain. Frontiers in Psychology. 2019;10:475.
13. Armknecht F, Karame GO, Mandal A, Youssef F, Zenner E. Ripple: Overview and outlook. In: Trust and Trustworthy Computing: 8th International Conference, TRUST 2015, Heraklion, Greece, August 24-26, 2015, Proceedings. Springer International Publishing; c2015. p. 163-180.
14. Aziz ATIF. Cryptocurrency: Evolution & legal dimension. International Journal of Business, Economics and Law. 2019;18(4):31-33.
15. Baker HK, Nofsinger JR, Puttonen V. Other Frauds and Scams that Lure Unsuspecting Investors. In: The Savvy Investor's Guide to Avoiding Pitfalls, Frauds, and Scams. Emerald Publishing Limited; c2020. p. 149-177.
16. Bamufleh D, Alshamari AS, Alsobhi AS, Ezzi HH, Alruhaili WS. Exploring public attitudes toward e-government health applications used during the COVID-19 pandemic: Evidence from Saudi Arabia. Computer and Information Science. 2021;14(3):1-24.
17. Bhaskar ND, Chuen DLK. Bitcoin mining technology. In: Handbook of Digital Currency. Academic Press; c2015. p. 45-65.
18. Bhattacharjee A, Chaudhary M, Ranganathan S. Adoption of Value-Based Pricing for Prescription Drugs: An Extension of Roger's Innovation Diffusion Theory. International Journal of Health Sciences. 2022;6:5347-5364.
19. Bhattacharyya DK. Research Methodology. Excel Books India; c2009.
20. Bradt J, Burns DS, Creswell JW. Mixed methods research in music therapy research. Journal of Music Therapy. 2013;50(2):123-148.
21. Brunnermeier MK, James H, Landau JP. The digitalization of money. National Bureau of Economic Research; 2019. Report No.: c26300.
22. Burns S. The Silicon Savannah: exploring the promise of cryptocurrency in Africa. In: The Economics of Blockchain and Cryptocurrency. Edward Elgar Publishing; c2022. p. 69-94.
23. Burns S. The Silicon Savannah: exploring the promise of cryptocurrency in Africa. In: The Economics of Blockchain and Cryptocurrency. Edward Elgar Publishing; c2022. p. 69-94.
24. Busayatananphon C, Boonchieng E. Financial technology DeFi protocol: A review. In: 2022 Joint International Conference on Digital Arts, Media and Technology with ECTI Northern Section Conference on Electrical, Electronics, Computer and Telecommunications Engineering (ECTI DAMT & NCON). IEEE; c2022. p. 267-272.
25. Buterin V. A next-generation smart contract and decentralized application platform. White Paper. 2014;3(37):2-1.
26. Caporale GM, Kang WY, Spagnolo F, Spagnolo N. Non-linearities, cyber attacks and cryptocurrencies. Finance Research Letters. 2020;32:101297.
27. Carroll JM, Bellotti V. Creating value together: The emerging design space of peer-to-peer currency and exchange. In: Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing; c2015. p. 1500-1510.
28. Catania L, Grassi S. Forecasting cryptocurrency volatility. International Journal of Forecasting. 2022;38(3):878-894.
29. Cermak V. Can Bitcoin Become a Viable Alternative to Fiat Currencies? An empirical analysis of Bitcoin's volatility based on a GARCH model; c2017.
30. Champagne P. The Book of Satoshi: The Collected Writings of Bitcoin Creator Satoshi Nakamoto; c2014.
31. Chan W, Olmsted A. Ethereum transaction graph analysis. In: 2017 12th International Conference for Internet Technology and Secured Transactions (ICITST). IEEE; c2017. p. 498-500.
32. Chang TH, Svetinovic D. Improving bitcoin ownership identification using transaction patterns analysis. IEEE Transactions on Systems, Man, and Cybernetics: Systems. 2018;50(1):9-20.
33. Chao CM. Factors determining the behavioral intention to use mobile learning: An application and extension of the UTAUT model. Frontiers in Psychology. 2019;10:1652.
34. Daniel PS, Sam AG. Research Methodology. Gyan Publishing House; c2011.
35. Dawadi S, Shrestha S, Giri RA. Mixed-methods research: A discussion on its types, challenges, and criticisms. Journal of Practical Studies in Education. 2021;2(2):25-36.
36. De Koker L. The 2012 revised FATF recommendations: Assessing and mitigating mobile money integrity risks within the new standards framework. Washington Journal of Law, Technology & Arts. 2013;8(3):165.
37. De Vries A. Bitcoin's energy consumption is underestimated: A market dynamics approach. Energy Research & Social Science. 2020;70:101721.
38. Değerli A, Aytekin Ç, Değerli B. Analyzing information technology status and networked readiness index in context of diffusion of innovations theory. Procedia - Social and Behavioral Sciences. 2015;195:1553-1562.
39. Fairfield JA. Smart contracts, Bitcoin bots, and consumer protection. Washington & Lee Law Review Online. 2014;71:35.
40. Fan L. Mobile investment technology adoption among investors. International Journal of Bank Marketing. 2022;40(1):50-67.
41. Fang T, Su Z, Yin L. Economic fundamentals or investor

perceptions? The role of uncertainty in predicting long-term cryptocurrency volatility. International Review of Financial Analysis. 2020;71:101566.
42. Fayad R, Paper D. The technology acceptance model e-commerce extension: A conceptual framework. Procedia Economics and Finance. 2015;26:1000-1006.
43. Goddard W, Melville S. Research Methodology: An Introduction. Juta and Company Ltd; c2004.
44. Greenland S, Senn SJ, Rothman KJ, Carlin JB, Poole C, Goodman SN, Altman DG. Statistical tests, P values, confidence intervals, and power: a guide to misinterpretations. European Journal of Epidemiology. 2016;31:337-350.
45. Grinberg R. Bitcoin: An innovative alternative digital currency. Hastings Science & Technology Law Journal. 2011;4:160.
46. Grobys K, Huynh TLD. When Tether says "JUMP!" Bitcoin asks "How Low?". Finance Research Letters. 2022;47:102644.
47. Gunay S. Impact of public information arrivals on cryptocurrency market: A case of Twitter posts on ripple. East Asian Economic Review. 2019;23(2):149-168.
48. Gupta A, Gupta N. Research Methodology. SBPD Publications; c2022.
49. Gupta S, Sadoghi M. Blockchain transaction processing. arXiv preprint arXiv:2107.11592; c2021.
50. Haile L. Factors Affecting the Adoption of Mobile Banking in Commercial Bank of Ethiopia [dissertation]. St. Mary's University; c2015.
51. Halcomb EJ, Hickman L. Mixed Methods Research. c2015.
52. Hamayel MJ, Owda AY. A novel cryptocurrency price prediction model using GRU, LSTM and bi-LSTM machine learning algorithms. AI. 2021;2(4):477-496.
53. Hu K, Zhang Z. Fast lottery-based micropayments for decentralized currencies. In: Information Security and Privacy: 23rd Australasian Conference, ACISP 2018, Wollongong, NSW, Australia, July 11-13, 2018, Proceedings. Springer International Publishing; c2018. p. 669-686.
54. Hughes AS. Mixed methods research. APS Observer. 2016; 29.
55. Iansiti M, Lakhani KR. The truth about blockchain. Harvard Business Review. 2017; 95(1):18-127.
56. Jegerson D, Khan M, Mertzanis C. Adoption of cryptocurrencies for remittances in the UAE: the mediation effect of consumer innovation. European Journal of Innovation Management; c2023.
57. Kaponda K. An interrogation into the regulatory challenges of virtual currencies on the Zambian economy; c2019. Available from: SSRN: https://ssrn.com/abstract=3509503
58. Kaponda K. An investigation into the state of cryptocurrencies and regulatory challenges in Zambia [Internet]. 2019. Available from: SSRN: https://ssrn.com/abstract=3433153
59. Kaponda K, Mungule OK, Mwange A. The cost of cash processing as a determinant of the central bank digital currency: A critical analysis of the Zambian case; c2022.
60. Kaushal PK, Bagga A, Sobti R. Evolution of Bitcoin and security risk in Bitcoin wallets. In: International Conference on Computer, Communications and Electronics (Comptelix); 2017 Jul 5-7; New York, NY. New York: IEEE; c2017. p. 172-177.
61. Kaushal PK, Bagga A, Sobti R. Evolution of Bitcoin and security risk in Bitcoin wallets. In: 2017 International Conference on Computer, Communications and Electronics (Comptelix); 2017 Jul 5-7; New York, NY. New York: IEEE; c2017. p. 172-177.
62. Kaya Soylu P, Okur M, Çatıkkaş Ö, Altintig ZA. Long memory in the volatility of selected cryptocurrencies: Bitcoin, Ethereum and Ripple. Journal of Risk and Financial Management. 2020;13(6):107.
63. Küfeoğlu S, Özkuran M. Bitcoin mining: A global review of energy and power demand. Energy Research & Social Science. 2019; 58:101273.
64. Lee JW. Diffusion of innovations. In: Encyclopedia of Sport Management. Cheltenham: Edward Elgar Publishing; 2021. p. 137-138.
65. Lemieux P. Who is Satoshi Nakamoto? Regulation. 2013; 36(3):14-15.
66. Abah AE, Awi-Waadu GDB, Nduka FO, Richard A. Malaria infection and socio-economic status of some residents of Port Harcourt metropolis, Rivers State, Nigeria. Journal of Applied Science and Environmental Management. 2017;21(2):299-304.
67. Abanobi OC. Core concepts in epidemiology and public health practice: Quick reference. Owerri: Abanaheart Publication; c2010. p. 160-163.
68. Asenso-Okyere WK, Dzator JA. Household cost of seeking malaria care: A retrospective study of two districts in Ghana. Social Science & Medicine. 1997;45:659-667.
69. Becker MH, Haefner DP, Kasi SV. Selected psychosocial models and correlates of individual health-related behavior. Medicine. 1977;15:27-46.
70. Berman PC, Kendal T, Bhattacharyya K. The household production of health: Integrating social science perspectives on micro-level health determinants. Social Science & Medicine. 1994;38(2):205-215.
71. Bruce-Chwatt LJ. History of malaria from prehistoric to eradication. In: Wernsdorfer WH, McGregor I, editors. Malaria: Principles and practice of malariology. Edinburgh: Churchill Livingstone; 1988. p. 1-59.
72. Chijioke-Nwauche I, Maduka O, Anopeju A, Oboro I, Paul N, Ogoro M, Otto G, et al. Malaria and its economic burden among pregnant women in Rivers State, Nigeria. Open Journal of Obstetrics and Gynaecology. 2020;10:571-582.
73. Chima RI, Goodman CA, Mills A. The economic impact of malaria in Africa: A critical review of the evidence. Health Policy. 2003;63(1):17-36.
74. Chukwuocha UM, Ukaga CN, Dozie INS, Nwoke BEB, Breiger WR, Nwankwo E, et al. Social and behavioural baseline for guiding implementation of an efficient trial of insecticide-treated bed nets for malaria control in Nsukka, Nigeria. International Quarterly Journal of Community Health. 1997;16:47-61.
75. Drummond M. Cost of illness: A major headache? Pharmaco-economics. 1992;2:1-4.
76. Ebong OO, Nwauche CA, Ogbuehi IH, Chijioke-Nwauche IN, Ezirim CT, Umoh RE, et al. Is this evidence of success in malaria prevention and control measures? Greener Journal of Medical Sciences. 2015;5:1-10. Available from: https://doi.org/10.15580/GJMS.2015.051114379
77. Eleanya EU. Anaerobic digestion of wastes by microorganisms and its health effect on waste disposal

workers. PhD thesis, Postgraduate School, Rivers State University, Medical Microbiology Department, University of Nigeria; c2015.
78. Ezeanya CI. Seasonal variation in malaria episodes among residents in Udi, a semi-urban community in Southeast Nigeria. The Journal of Parasitology. 1998;19(1):39-43.
79. Federal Ministry of Health (FMOH). National Malaria Control Programme/Federal Ministry of Health Annual Report; c2005.
80. Ghebreyesus TA, Alemayehu T, Bosma A, Witten KH, Teklehaimanot A. Community participation in malaria control in Tigray region Ethiopia. Acta tropica. 1996;61(2):145-156.
81. Glanz K, Rimer BK, Viswanath K, editors. Health Behavior and Health Education: Theory, Research, and Practice. 4th ed. San Francisco: Jossey-Bass; c2008.
82. Jimoh A, Sofola O, Petu A, Okorosobo T. Quantifying the economic burden of malaria in Nigeria using the willingness to pay approach. Cost Effectiveness and Resource Allocation. 2007;5:1428-1754.
83. Kirigia JM, Snow RW, Fox-Rushby J, Mills A. The cost of treating paediatric admissions and the potential impact of insecticide-treated mosquito nets on hospital expenditure. Tropical Medicine and International Health. 1998;3(2):145-150.
84. Kioko UM. The economic burden of malaria in Kenya: A household level investigation. Doctoral thesis, University of Kenya; c2007.
85. Laxminarayan R. Does reducing malaria improve household living standards? Tropical Medicine and International Health. 2004;9(2):267-271.
86. Leighton C, Foster R. Economic impacts of malaria in Kenya and Nigeria. Bethesda, MD: Abt Associates; c1993.
87. Lindsay SW, Martens WJ. Malaria in the African highlands: Past, present and future. Bulletin of the World Health Organization. 2001;76:33-45.
88. Lucas AM. Economic effects of malaria eradication: Evidence from the malaria periphery. Brown University; c2005.
89. Matur DM, Azare BA, Ugbong L. The prevalence of asymptomatic malaria parasitemia amongst undergraduate students of University of Abuja. The Nigerian Journal of Parasitology. 2001;22:44-62.
90. Mbanugo JI, Ejims DO. Plasmodium infections in children aged 0-5 years in Awka metropolis, Anambra State, Nigeria. Nigerian Journal of Parasitology. 2000;21:55-59.
91. Mitra BS, Tren R. The burden of malaria. Liberty Institute, Occasional Paper No. 12. New Delhi: Liberty Institute; c2002.
92. National Bureau of Statistics. Labour force statistics – 1: Unemployment and underemployment report; c2018.
93. Onwujekwe OE, Chima R, Okono PO. Economic burden of malaria illness versus that of a combination of all other illnesses: A study in five malaria holo-endemic communities. Health Policy. 2000;54:143-159.
94. Packard RM. The political economy of malaria epidemics in colonial Swaziland. Cambridge Journal of African Studies. 1984;25(2):189-212.
95. Pehrson PO, Bjorkman A, Brohult J. Is the working capacity of Liberia industrial workers increased by regular prophylaxis? Annals of Tropical Medicine and Parasitology. 1984;75(5):487-94.
96. Pondei KE, Lawani I, Ndiok E. Prevalence of the malaria parasite in screened blood in a tertiary health centre in the malaria-endemic Niger Delta region of Nigeria. Global Advanced Research Journal of Microbiology. 2012;1:188-193.
97. Prescott N. Coping with catastrophic health shocks. Paper presented at the conference on social protection and poverty; Inter-American Development Bank; Washington, DC; c1999.
98. Pryer J. When breadwinners fall ill: Preliminary findings from a case study in Bangladesh. Bulletin of the World Health Organization. 1989;20:49-57.
99. Ranson K. Reduction of catastrophic healthcare expenditures by a community-based health insurance scheme in Gujrat, India: Current experiences and challenges. Bulletin of the World Health Organization. 2002;80:613-621.
100. Republic of Kenya. Kenya Welfare Monitoring Survey. Central Bureau of Statistics: Ministry of Finance and Planning; Nairobi; c2006.
101. Rice DP. Cost of illness studies: Fact or fiction? Lancet. 1994;341:1519-1520.
102. Rolle AR, Omon IJ. Economic burden of malaria: Evidence from Nigeria's data. Amity Journal of Healthcare Management. 2018;3:28-39.
103. Russell S. Can households afford to be ill? The role of the healthcare system, material resources, and social networks in Sri Lanka. PhD thesis, London School of Hygiene and Tropical Medicine, University of London; c2001.
104. Russell S. Ability to pay for healthcare: Concepts and evidence. Health Policy and Planning. 1996;11:219-237.
105. Russell S. The economic burdens of illness for households in developing countries: A review of studies focusing on malaria, tuberculosis, and human immunodeficiency virus/acquired immune deficiency syndrome. American Journal of Tropical Medicine and Hygiene. 2004;71(2):147-155.
106. Russell S. Illuminating cases: Understanding the economic burden of illness through case study household research. London School of Hygiene and Tropical Medicine. Oxford University Press; c2005. Available from: https://doi.org/10.1093/heapol/pci035
107. Malaney P, Sachs J. The economic and social burden of malaria. Nature. 2002;415(6872):680-685.
108. Sauerborn R, Nougtara A, Hien M, Diesfeld HJ. Seasonal variations of household costs of illness in Burkina Faso. Social Science & Medicine. 1996;43:281-290.
109. Sauerborn R, Adams A, Hien M. Household strategies to cope with the economic cost of illness. Social Science & Medicine. 1999;43:291-301.
110. Scoones I. Sustainable Rural Livelihoods: A Framework for Analysis. IDS Working Paper 72. Brighton: Institute of Development Studies; c1998.
111. Wu Y, Fan H, Wang X, Zou G. A regulated digital currency. Science China Information Sciences. 2019;62:1-12.
112. Xue G, Xu J, Wu H, Lu W, Xu L. Incentive mechanism for rational miners in Bitcoin mining pools. Information Systems Frontiers. 2021;23:317-327.
113. Yadav SR. Cryptocurrency: The future of money and its journey so far in India. Multi-Disciplinary Research for

Saving; c2022; p. 187.
114. Zhong L, Wu Q, Xie J, Li J, Qin B. A secure versatile light payment system based on blockchain. Future Generation Computer Systems. 2019;93:327-337.
115. Zubir DASBHM, Aishah DN, Ali DA, Mokhlis DS, Sulong DF. Doing business using cryptocurrency in Malaysia. International Journal of Management and Humanities. 2020;4(9):48-157.
116. Zulhuda S. Whither policing cryptocurrency in Malaysia? IIUMLJ. 2017;25:179.