Interdisciplinary Journal of Information, Knowledge, and Management

An Official Publication of the Informing Science Institute InformingScience.org

IJIKM.org

Volume 17, 2022

BITCOIN: AN EXPLORATORY STUDY INVESTIGATING ADOPTION IN SOUTH AFRICA

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ABSTRACT

Aim/Purpose	This paper identified and explored the factors influencing Bitcoin adoption and use in South Africa.
Background	Since its introduction in 2008, the value and popularity of Bitcoin has risen exponentially. Captivating the eyes of the world, from regulators to economists, Bitcoin promises to revolutionize the digital currency space. Despite being over 10 years old, the concept of cryptocurrency is fairly new in South Africa, a developing country. South African's interest in Bitcoin continues to grow with the country constantly ranking within the top 10 in online searches for "Bitcoin" and "cryptocurrency" on Google. The primary objective of this research was to identify adoption factors amongst South African citizens, an area that has not received much research focus in the past. In addition to this, the study aimed to identify how Bitcoin is primarily used in South Africa.
Methodology	A survey-based questionnaire was utilized to obtain responses from adopters of Bitcoin in South Africa. The quantitative survey was completed by 204 respondents.
Contribution	This research contributes to the body of knowledge relating to Bitcoin adoption, specifically from a developing country. Adoption factors are identified that can be utilized by businesses that intend to adopt cryptocurrency, to strategically prepare for the potential risks or opportunities brought about by Bitcoin and cryptocurrency in general.
Findings	The findings of this study indicate that while perceived usefulness, perceived ease of use, subjective norms, and facilitating conditions positively influence intention to adopt Bitcoin, trust was the only construct that is statistically significant and hence is the greatest driver of adoption in South Africa. In terms of its primary use in South Africa, the study revealed that Bitcoin is used as a

Accepting Editor Dirk Frosch-Wilke | Received: February 22 2022 | Revised: March 30, April 6, April 13, 2022 | Accepted: April 14, 2022.

Cite as: Jankeeparsad, R. W., & Tewari, D. (2022). BITCOIN: An exploratory study investigating adoption in South Africa. *Interdisciplinary Journal of Information, Knowledge, and Management*, *17,* 191-214. https://doi.org/10.28945/4947

	speculative instrument for short-term trading in South Africa followed by being used as a long-term investment in the crypto-asset class. No respondent indicated that they utilize Bitcoin as a payment method in South Africa.
Recommendations for Practitioners	When developing crypto-based investment products, custodians of assets must ensure that a minimum-security protocol is followed to safeguard these assets. This will enhance the trust that potential investors and customers have in their systems and products.
Recommendations for Researchers	This study focused on adoption factors for South African citizens. Future studies should be conducted to identify adoption factors by businesses in South Africa.
Impact on Society	Bitcoin offers an alternate trading instrument and investment option, with the possibility of large gains over a relatively short period. Bitcoin also presents the possibility of cross-border transactions at a significantly lower cost compared to traditional cross-border transfers of funds.
Future Research	Studies should be conducted to explore the factors influencing the adoption of altcoins to determine if the technological differences influence the adoption of one currency over the other. Research should also be conducted comparing the taxation of cryptocurrency in various countries around the world.
Keywords	Bitcoin, cryptocurrency, South Africa

INTRODUCTION

Since the advent of the internet, e-commerce and digital transactions have grown at a rapid pace. From businesses to governments around the world, technology is utilized in various ways to meet the needs of both the user and the developer of a specific technological product. It is no surprise then that the rapidly changing world of technology has created a demand for, and consequential development of, different electronic payment systems, one of which is digital currencies. Cryptocurrency, a form of digital currency, utilizes cryptography for enhanced security (Farell, 2015). The first cryptocurrency, Bitcoin, was created by the person or group using the pseudonym Satoshi Nakamoto. Originally, Bitcoin was created to serve as a peer-to-peer decentralized payment system without the need for a 3rd party intermediary such as a bank. For countries without a developed banking system and where access to such intermediaries is restricted, Bitcoin offers a viable alternative (Connolly & Kick, 2015). It is widely reported that the catalyst for the development of cryptocurrency was the financial recession of 2008.

Originally, Bitcoin was utilized as a currency for basic tasks, such as trading the cryptocurrency for programming assistance. The first reported commercial transaction with Bitcoin involved the trading of two pizzas valued at USD25 delivered for 10,000 Bitcoin. Since then, the use cases and value of Bitcoin have increased exponentially. As of 2022, the cryptocurrency is utilized as a speculative instrument for short-term trading, held as an investment in the crypto-asset class, and used as a medium of exchange/currency for transactional purposes. Notorious for its peaks and valleys, the value of one Bitcoin peaked at over USD67,000 in 2021, representing unprecedented growth in its 12 years of existence, as illustrated in Figure 1. Bitcoin is accepted by a wide variety of businesses and retailers around the world. El Salvador became the first country to officially recognize Bitcoin as legal tender (Businesstech, 2021). In many countries, including South Africa, Bitcoin automatic teller machines can be found which allow users to buy and sell Bitcoin for cash (Madiera, 2017). In December 2017, the first-ever Bitcoin futures became available increasing its appeal to mainstream traders. Futures are a type of contract where investors agree to buy or sell an asset on a specific future date at a specific price (Matthews, 2021). The trading of Bitcoin futures represents a historic event for Bitcoin

because, while the price of Bitcoin remains unregulated, Bitcoin futures will be traded on regulated exchanges. Since then, many other exchange-traded funds and crypto investment products have been launched, increasing the credibility of Bitcoin and cryptocurrency as a viable trading and investment alternative. Global professional services firm, PWC, has reported that the value of crypto hedge funds had doubled over the year from 2019 to 2020 (PWC, 2020).

Figure 1. Bitcoin price history chart (Coinmarketcap.com, 2022, used with permission)

South Africans are no strangers to the crypto phenomenon as the country constantly ranks within the top 10 in online searches for "Bitcoin" and "cryptocurrency" on Google (Google Trends, 2022). In addition, 10.7% of South African internet users own cryptocurrency, the highest per capita in the world (Cyrus, 2019). It is, therefore, no surprise that Bitcoin adoption is gaining traction in South Africa. Even though cryptocurrency has taken these massive leaps forward, Bitcoin (and cryptocurrency in general) is still a relatively new concept for South Africans. As this technology is fairly new, it is not clear what the requirements for successful Bitcoin adoption in South Africa are. Compared to other countries such as India and the USA which account for 100 million and 27 million owners of cryptocurrency respectively, the adoption rate and use of Bitcoin in South Africa are significantly lower with just over 4 million owners being reported (Triple A., 2021). The research problem that this study, therefore, aims to address is the identification of the determinants influencing the adoption of Bitcoin by South African citizens. Factors that influence adoption need to be determined to be able to give a better future perspective of Bitcoin in South Africa. In addition to this, the study aims to determine how current owners of Bitcoin utilize Bitcoin in South Africa.

This research paper is organized as follows: it commences with an overview of Bitcoin describing its origin, uses, and risks. Technology acceptance models are then analyzed to construct a research model for this study. The hypotheses are then presented, followed by a description of the research method utilized. The results of the analysis are then discussed, followed by the conclusion, limitations of the study, and recommendations for future research.

BITCOIN: A REVIEW OF ITS DEVELOPMENT, USES, AND RISKS

The genesis of cryptocurrency is a digital currency. Unlike electronic money, which is basically an electronic representation of a fiat currency, digital currencies are a digital representation of value that functions as a medium of exchange, that is denominated in its own unit of account, and/or a store of value (Aqui, 2014). Digital currencies, introduced in the mid-1990s, are created and issued by private companies, without the involvement or backing of any governmental agencies, and have no physical counterpart (Gans & Halaburda, 2015). In contrast to digital currency, electronic money is a digitized version of fiat currency that is used in everyday transactions (e.g., the use of credit cards and debit cards). Interestingly, during its infancy stages, many private digital currencies were set up to

function within non-currency-specific platforms that were limited to closed environments (e.g., video games and virtual worlds). Digital currencies have varying levels of convertibility to fiat currencies. Some digital currencies can only be used within a self-contained virtual environment thereby restricting their ability to be converted to fiat currencies. Early attempts at viable digital currencies, such as E-Gold and Digicash, failed due to low adoption rates and issues such as security breaches, money laundering, and instances where digital currencies were easily reproduced (de Vries, 2018).

To alleviate the need for a 3rd party intermediary, Bitcoin was developed by a group or person using the pseudonym Satoshi Nakamoto. The creator(s) have described Bitcoin as "an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party" (Nakamoto, 2008). Bitcoin exhibits traits of both commodity-based currencies and fiat currencies. Its limited supply is akin to a commodity such as gold, but it has no intrinsic value (Baur et al., 2018). Unlike other initial digital currencies, Bitcoin is convertible to fiat currencies, and its use is not limited to the virtual world thereby rendering it more practical for everyday use.

Any individual or entity can open a Bitcoin account without any charges or vetting processes that are usually required by legislation when opening a traditional bank account (as per the Financial Intelligence Centre Act, 38 of 2001 in South Africa). The user will then be provided with a digital "wallet" which can be used to store, send, and receive Bitcoin. Within the Bitcoin network, all transactions (i.e., the sending and receiving of Bitcoin) are transparent and can be viewed by the public; however, all users are anonymous as they are not identified by their actual identities but only identified by public keys (Reid & Harrigan, 2013). When a Bitcoin transaction is completed, the transaction is recorded on a transaction log and is then validated to make sure that the sender actually owned the sent Bitcoins and that the sent Bitcoins arrived where they were intended (Glass, 2016). This verification process performed by the nodes is called "mining". This transaction log is called the "blockchain" and records every single transaction and the ownership of every single Bitcoin in circulation. Unlike the traditional concept of "mining", in the Bitcoin network, "mining" involves substantial computing power (in terms of both hardware and software) where miners try to solve a mathematical problem. The miner who manages to solve the mathematical problem first mines the next block, adding it to the chain thereby validating the transactions within it. In return for their services, the miner who solved the mathematical problem is rewarded in Bitcoin, adding to the stock of Bitcoin, which results in "money creation" (Tschorsch & Scheuermann, 2016). This system is referred to as the "proof or work system" because the probability of mining the block correlates with the amount of work that is put in. The creation and processing of Bitcoin are illustrated in Figure 2.

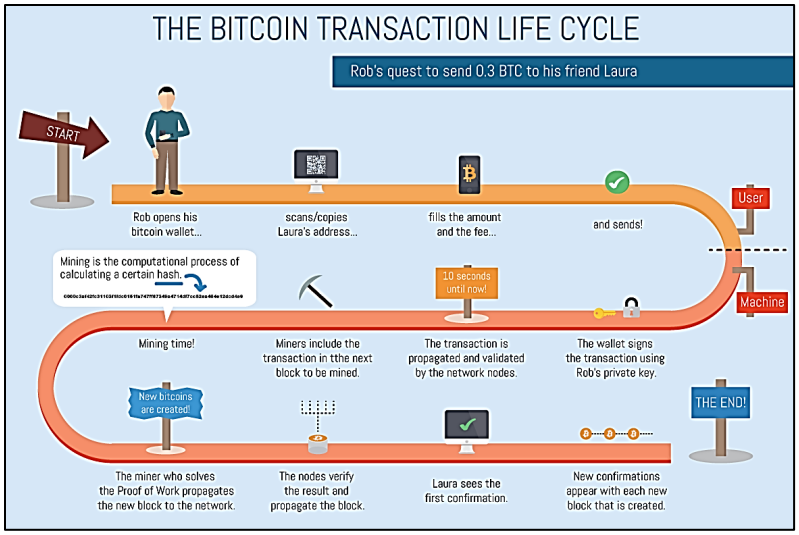

Figure 2. Bitcoin transaction life cycle (Ankalkoti & Santhoshs, 2017)

Unlike the supply of fiat currency, which can be increased at the discretion of the central financial authority (e.g., the South African Reserve Bank), the supply of Bitcoin is predetermined and will continue to increase at a decreasing rate as the number of coins in circulation reaches its algorithmically fixed production limit (Folkinshteyn & Lennon, 2017). The supply of Bitcoin is limited to 21 million coins and per the built-in algorithm, this ceiling will be reached in the year 2140 and there will be no new coins issued thereafter. Due to this limited supply, many economists believe that Bitcoin has the potential to be impervious to inflation and makes it an attractive investment option, similar to commodities and gold which are also limited in nature.

Initially, Bitcoin was designed as a peer-to-peer payment system to enable transactions across borders, without the interference of a third party to verify transactions and the need to comply with strict monetary and exchange control policies. Since then, it is being utilized as a speculative instrument for profit-making, held as an investment in the crypto asset class, used for cross-border transfers of money, and is being used by institutional investors in products such as Bitcoin futures. Due to its somewhat anonymous nature, Bitcoin has been plagued by its use in illicit trade, money laundering, and widely publicized security breaches of its various exchanges across the world. Whilst the Bitcoin transactional process remains unbreachable, custodians of these crypto assets have been attacked on several occasions, resulting in losses totaling billions of dollars. Bitcoin exchanges in most countries (including South Africa) operate within a regulatory void and hence there is no minimum-security protocol that these exchanges need to adhere to. This essentially results in no protection or recourse for the investor in the event of a security breach. South Africans are no strangers to these breaches. In 2021, one of the largest exchange breaches occurred at Africrypt, a South African-based cryptocurrency exchange, resulting in losses exceeding USD3 billion (Charoenwong & Bernardi, 2021).

As a payment method or means of transacting, Bitcoin has been adopted by many businesses, including Microsoft and Overstock (Lisa, 2022). The number of businesses accepting Bitcoin has increased from just 3 in 2013 to over 22,000 in 2022, as illustrated in Figure 3. Prior to 2015, the only way to spend or transfer Bitcoin was via direct wallet transfer using the internet and an internet-enabled device (computer, smartphone, or tablet). This required the sender to transfer Bitcoin directly from their wallet to the receiver's wallet by entering the receiver's unique and complex Bitcoin ID. This process, similar to an online electronic fund transfer, is tedious and long drawn out, especially during face-to-face transactions. Realizing this challenge, global payment service provider (PSP) Bitpay partnered with Ingenico, a point of sale (POS) terminal provider, to develop POS terminals to facilitate the transfer of Bitcoin by merely scanning a quick response (QR) code from a mobile device (Hoang, 2017). Since then, many other companies have started offering Bitcoin POS services which have facilitated the increased adoption of cryptocurrency in the retail space. In its original form, the Bitcoin protocol has significant design issues that make it impractical for daily use by retailers and businesses, specifically those that trade in fast-moving consumer goods. Firstly, the lack of scalability inhibits its adoption and widescale use, as Bitcoin is only capable of processing 4.6 transactions per second (Kenny, 2019). This pales in comparison to the likes of Visa which can process up to 65,000 transactions per second (Fonda, 2022). The next drawback to the Bitcoin algorithm is that Bitcoin transactions cannot be reversed. Businesses required to process refunds often do so with a store credit or fiat currency directly. Finally, and possibly the most significant factor inhibiting widescale adoption, the price of Bitcoin is extremely volatile. This makes pricing items in Bitcoin a difficult task as a business stands to lose financially should the price of Bitcoin suddenly fall to unexpected lows.

Although existing in a virtual network, cryptocurrencies are dependent on physical resources. A significant amount of research and media coverage has been focused on the negative impact that cryptocurrency has on the economy and financial sector; however, cryptocurrency also negatively impacts the environment and the resources available. In a study on the carbon emissions as a result of Bitcoin, the researchers concluded that it takes more energy to mine Bitcoin than it takes to mine the equivalent value of gold (Krause & Tolaymat, 2018). It is clear that the growing energy requirements demanded by cryptocurrency and resultant emissions are cause for concern. In light of the resolution

agreed to keep global warming less than 2 degrees celsius at the Paris Climate Conference (COP21), policymakers the world over need to monitor the carbon footprint as a result of cryptocurrency mining (European Commission, 2015).

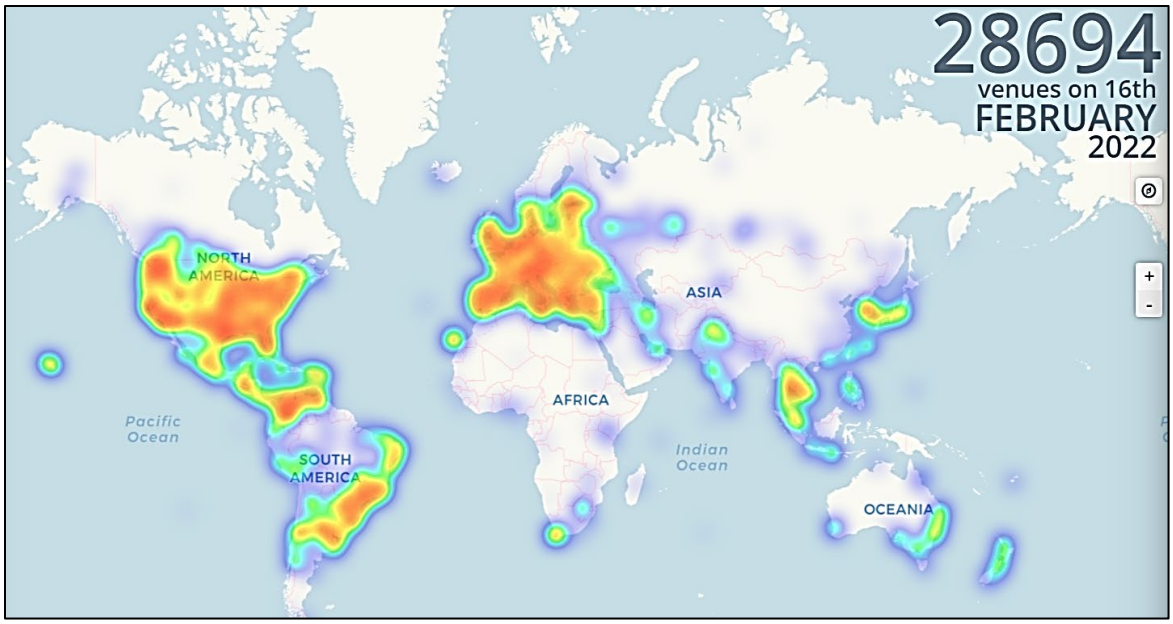

Figure 3. Businesses accepting bitcoin – February 2022 (Coinmap.org, 2022)

LITERATURE REVIEW

Bitcoin, a digital currency, is an information technology innovation. Given its highly sophisticated technological nature, examining research into technology acceptance was deemed to be an appropriate starting point. Research into technology adoption has examined factors including information systems, psychology, and sociology (Venkatesh et al., 2003). A significant factor in the research of technology acceptance has been the ability of intention-based models to predict actual usage. Literature suggests that intention is an accurate predictor of actual usage and in a situation where the technology being investigated is available for use (like Bitcoin which is available in South Africa), intentions are the preferred predictor and determinant of actual usage (Szajna, 1996). Based on this, an intention-based model was selected as a basis for the development of an appropriate research model for this study. This decision is supported by previous studies on Bitcoin adoption in other countries including Arias-Oliva et al. (2019), Folkinshteyn and Lennon (2017), Novendra and Gunawan (2017), and Walton and Johnston (2018). In developing the research model for this study, the technology acceptance model (TAM) and the theory of planned behavior (TPB) were utilized.

TECHNOLOGY ACCEPTANCE MODEL (TAM)

TAM posits that two beliefs in the form of "perceived usefulness" and "perceived ease of use" are the primary factors influencing an individual's attitude with regard to information system adoption as illustrated in Figure 4 (Davis, 1989). In the Bitcoin context, perceived usefulness refers to the notion that the more a person believes that Bitcoin will enhance their investing portfolio, increase their trading profits or increase their payment efficiency, the greater the possibility of its use. In contrast to this, perceived ease of use suggests that the easier an individual believes Bitcoin is to trade, invest in or use, the more likely they are to use it. Whilst TAM in its original state has been utilized to analyze the acceptance of various technologies, it was developed to analyze basic information technology usage and has been criticized for this. Research suggests that TAM provides inconsistent and unclear results (Legris et al., 2003). TAM also assumes that beliefs about usefulness and ease of use of a

technology are the principal determinants of its usage and does not consider other variables that could influence usage such as access to the necessary resources or social influences. Over the years since the development of TAM, there have been various modifications of the model by introducing additional constructs that consider behavioral control and social impact, amongst other factors. These modifications have attempted to address the original TAM's limitations and have resulted in more robust models, tailored for different technologies, environments, and subjects. With regard to analyzing the acceptance of Bitcoin, several versions of TAM have been used:

- Kumpajaya and Dhewanto (2015) conducted a study on the acceptance of Bitcoin in Indonesia utilizing a modified version of TAM. In their study, three additional variables were added which included "perceived compatibility", "Bitcoin knowledge," and "perceived risk". The results of this study indicated that all constructs hypothesized were supported and significantly influenced end-user adoption of Bitcoin in Indonesia.

- Folkinshteyn and Lennon (2017) conducted a study to determine the barriers to the adoption of Bitcoin and blockchain technology in general from the perspectives of developers and end-users. In their study, a modified version of TAM was utilized and an additional variable in the form of "perceived risk" was introduced to address the various risks associated with Bitcoin and its use. The study identified important factors about Bitcoin that users perceive about its usefulness and ease of use. The authors concluded that their modified version of TAM is a valuable framework for analyzing this evolving technology.

- Tveita and Borander (2018) facilitated a study on the adoption of blockchain technology in Norwegian corporations. TAM was selected as the model to achieve the study objectives and additional variables in the form of "organizations factors", "subjective norms", "knowledge about blockchain technology" and "experience with blockchain technology" were included. "Attitude" was removed from the model (as was the case in many studies utilizing the TAM framework) due to the inconsistencies of its actual effect on intention and actual usage. In their study, it was perceived usefulness and subjective norms that had the most significant impact on intention to use.

- Walton and Johnston (2018) conducted a study on the adoption of Bitcoin by the South African virtual community. In this study, the original constructs of TAM were utilized together with additional constructs. Specifically, "perceived benefits", "perceived ease of use", "perceived security risks", and "perceived trust risks" were utilized as independent variables. "Perceived usefulness", "subjective norms", and "perceived behavioral control" were intervening variables, and "intention to use Bitcoin" was the dependent variable. The results of the study indicated that "perceived benefit", "attitude towards Bitcoin", "subjective norms", and "perceived behavioral control" directly affected the participants' intentions to use Bitcoin. "Perceived benefit", "perceived usefulness", "perceived ease of use", and "trust-related risk" were found to indirectly affect intention to use Bitcoin.

- Jankeeparsad and Tewari (2018) utilized a modified version of TAM in their study on the adoption of Bitcoin by end-users. A new construct in the form of "Trust" was added to their research model which, together with the other constructs examined, was found to have a significant influence on intention to use Bitcoin.

It is therefore clear that the use of the original TAM for this study on the adoption of Bitcoin in South Africa will not be appropriate because additional factors such as social influences, risks, skills, resources, and opportunities needed to use Bitcoin are not considered. Individuals may perceive Bitcoin as useful and easy to use but may not have any intention to use the cryptocurrency due to social pressures, lack of technology or skill, as well as risks associated with Bitcoin.

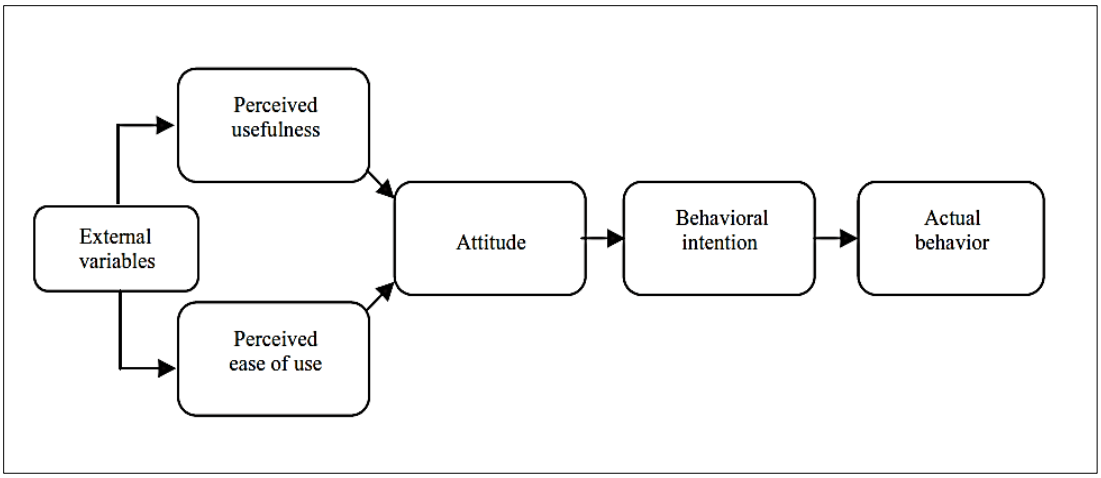

Figure 4. The Technology Acceptance Model (Davis, 1989)

Theory of Planned Behavior (TPB)

Perhaps the most influential and frequently cited model used for the prediction of human social behavior is the Theory of Planned Behavior (TPB) which was proposed by Ajzen (1991). As seen in Figure 5, TPB posits that behavioral intention is an immediate antecedent of actual behavior and in turn is determined jointly by attitude, subjective norms, and perceived behavioral control (Ajzen, 1991). Technology adoption studies suggest that the addition of perceived behavioral control considers the effect of factors such as ability, skill, availability of resources, and cooperation of others on the intention to utilize the technology in question (Gangwal & Bansal, 2016).

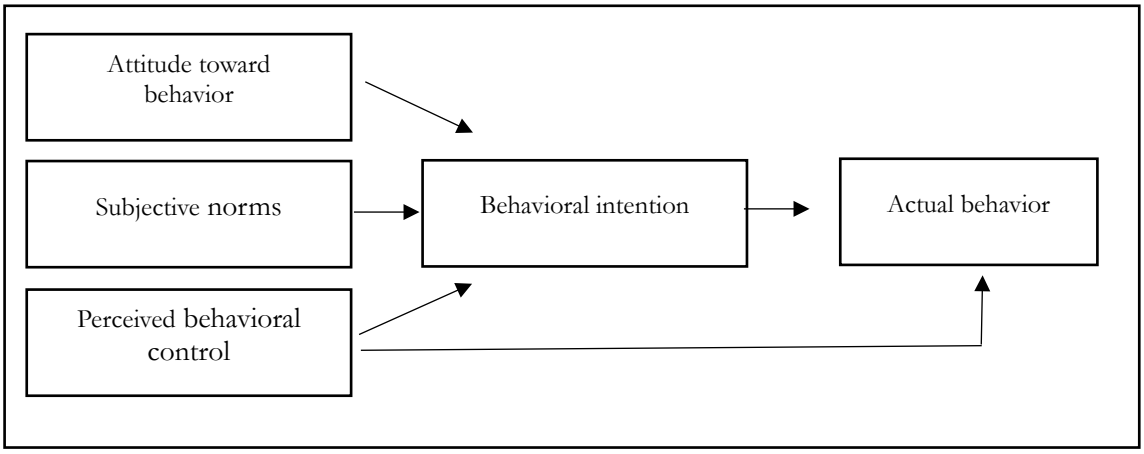

Figure 5. The Theory of Planned Behavior (Ajzen, 1991)

Development of a Research Model for Bitcoin Adoption in South Africa

In developing a research model for this study, the theories of both TAM and TPB were used as previous studies have concluded that neither of these two intentions-based models, used independently, have been found to provide consistently superior explanations or predictions of behavior (Fu et al., 2006).

The research model developed for this study appears in Figure 6. This is an eclectic model that is an extension of the model utilized by Jankeeparsad and Tewari (2018). The model utilized in this study will add to the body of knowledge on Bitcoin adoption in South Africa, and developing countries as a whole, by examining the impact of three moderating variables on the intention to use Bitcoin. These variables are age, gender, and income. Prior empirical studies have concluded that with new technology, adoption is generally higher amongst younger males (Venkatesh et al., 2003). Schuh and Shy (2015) suggest that it is expected that the use of Bitcoin will be stronger for men, particularly younger males. Bohr and Bashir (2014) determined that the average age of a Bitcoin owner in the USA was 33 and 95% of their respondents were males. A study conducted by Luno (2018) with respondents from 11 countries revealed that gender has a significant impact on the ownership of cryptocurrencies with males being more familiar with cryptocurrencies and therefore having higher ownership when compared to females. This finding was also supported by Tveita and Borander (2018) where 81% of the respondents were male.

With regard to income, while the prospect of owning Bitcoin may appeal to many, not many individuals may have the financial resources available to own or trade Bitcoin in South Africa. This could result in low-income individuals not adopting cryptocurrency. Arias-Oliva et al. (2019) reported that the income levels of current users of Bitcoin were quite high with over 38% of the respondents earning over 3,000 euros per month. The addition of these variables, therefore, builds on the literature regarding the adoption of Bitcoin.

In the proposed research model, the attitude construct of TPB has been decomposed using the perceived usefulness and perceived ease of use constructs from TAM. Several studies have analyzed the role that attitude plays in predicting behavioral intention. Fu et al. (2006) report that weak support was found for the relationship between attitudes toward a specific information system and behavioral intention to use that system. In a study conducted by Taylor and Todd (1995) to compare various technology adoption models, the researchers compared the TAM with TPB and another version of TPB called the Decomposed TPB which decomposed the original variables (including attitude) into more specific variables that can increase the accuracy of predicting a behavior. The study concluded that the decomposed version provides a better and more complete understanding of the determinants of a behavior when compared to the other models (Taylor & Todd, 1995). A decomposed model (as opposed to the original models) provides advantages over a unidimensional belief structure because it has been shown that belief is not a monolithic structure (Gangwall & Bansal, 2016). The decision to remove attitude has also been supported in studies conducted on the adoption of cryptocurrency and blockchain technology. Tveita and Borander (2018) removed the attitude construct from their model citing poor empirical support for its inclusion, while Abramova and Bohme (2016) developed a model using TAM as its starting point but excluded attitude in favor of the perceived risk of using Bitcoin.

For this study, perceived behavioral control has been replaced by "facilitating conditions", a variable more specific to the Bitcoin context. Perceived behavioral control in the original TPB referred to an individual's perception of the difficulty of enacting a behavior. In order for an end-user to ultimately adopt Bitcoin as a payment method or investment, the end-user must possess the necessary technology as well as the necessary technical support to be confident in its use. Failure to possess these facilitating conditions may result in an individual having an intention to adopt Bitcoin without access to the necessary resources to utilize the technology.

Similar to the model utilized by Jankeeparsad and Tewari (2018), the construct in the form of "trust" has been included in the proposed model as a direct determinant of behavioral intention. Since its introduction, Bitcoin has been plagued with security breaches resulting in Bitcoin worth billions of rands being misappropriated. The anonymous nature of Bitcoin transactions, coupled with decentralization, makes it all but impossible to trace the theft of Bitcoin. Despite the security concerns around the use of Bitcoin, blockchain technology was designed to increase trust due to the fact that all transactions are broadcast publicly (Folkinshteyn & Lennon, 2017).

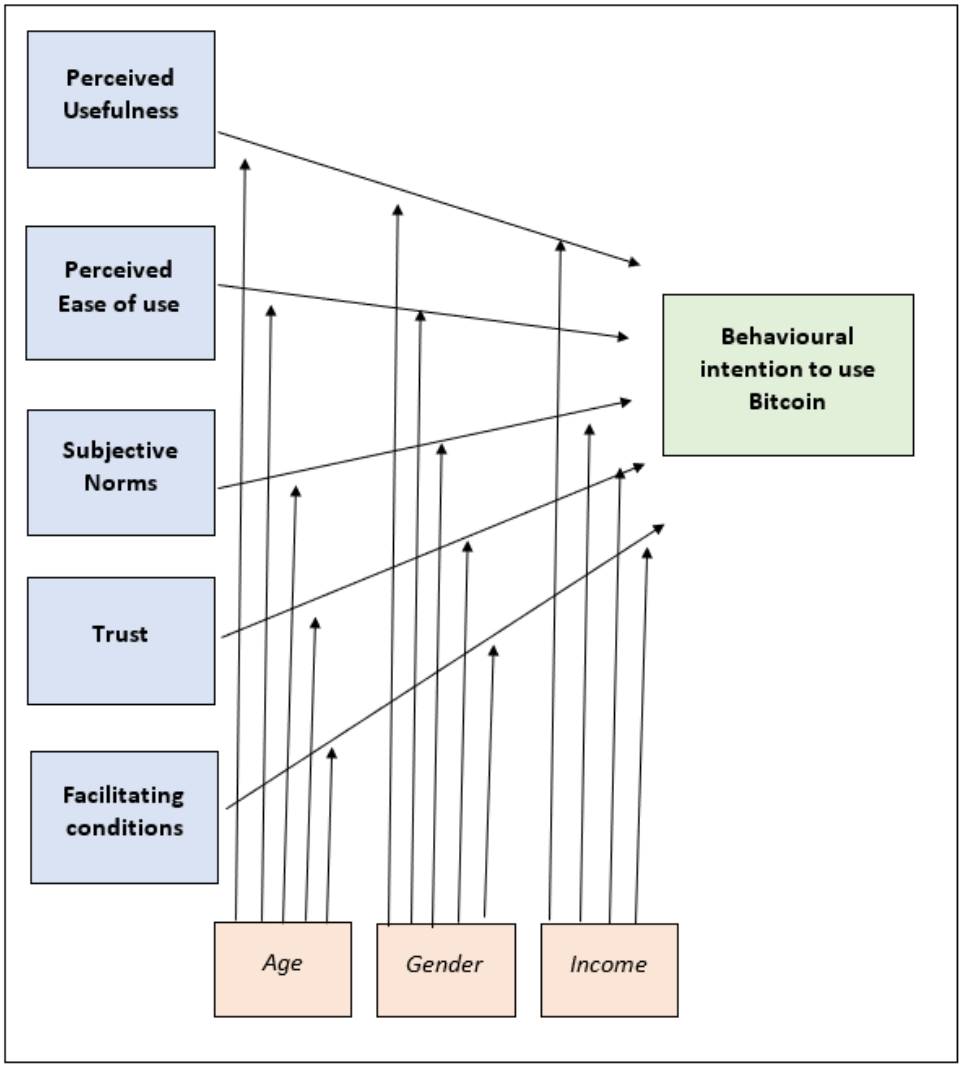

Figure 6. Proposed research model

Trust in the Bitcoin context refers to the user's trust in Bitcoin technology experienced before, during, and after engaging in a Bitcoin transaction (Sas & Khairuddin, 2017). For end-users to ultimately trust Bitcoin and the blockchain technology driving the process, they must be satisfied that their Bitcoin account is secure and that the exchanges they are trading from, wallet service providers being used, and online stores that they are purchasing from, have implemented the necessary safeguards to prevent any breach of security (Jankeeparsad & Tewari, 2018). As there is no minimum-security protocol for exchanges or wallet service providers, end-users are extremely vulnerable to security breaches with no recourse against any party for losses incurred.

Bitcoin exchanges around the world have adopted different approaches with regard to security and trust. There are those exchanges that make significant efforts to self-regulate in an effort of gaining the trust of a potential customer. Then some exchanges do not view trust as a priority (Gruber, 2013). Efforts made by exchanges to enhance the trustworthiness of their service offering (such as those offered by Luno) include requiring personal information such as proof of identification and residence of a potential user. This information is voluntarily requested in an effort to comply with laws around anti-money laundering and know your customer (KYC) among other regulations. Exchanges that do not request such information do so in an effort to increase the convenience of using

their services and believe that requesting such information from a potential user would decrease the level of convenience in using their service (Gruber, 2013).

Silinskyte (2014) reports that out of the 13 respondents who did not use Bitcoin in their study, 4 cited "no trust" as the primary reason for their decision. Zarifis et al. (2014) determined that respondents who were aware of and understood the technological innovations offered by Bitcoin trusted the Bitcoin network more than users with limited knowledge of it. In addition to this, the same study revealed that government involvement and regulation would increase trust amongst non-users. Presthus and O'Malley (2017) found that one of the main reasons non-users of Bitcoin have not adopted the technology is due to security concerns surrounding the use of Bitcoin. Although the use of Bitcoin carries a number of security risks and challenges, the core blockchain technology remains reliable with the majority of losses being incurred due to fraud, user error, and inadequate security measures by exchanges and developers (Folkinshteyn & Lennon, 2017).

METHODOLOGY

This is an empirical study in which new data was collected relating to the research objectives identified. A quantitative approach was adopted, and a survey-based questionnaire was selected as the research instrument. As there is no central database of Bitcoin holders that can be drawn upon, the researcher contacted Bitcoin exchanges operating from South Africa in an attempt to obtain a list of individuals who actively trade Bitcoin from their respective exchanges. This request was denied due to their respective customer privacy policies. South African virtual communities such as cryptocurrency forums and social media pages on Bitcoin were then considered the best platforms to obtain responses to the questionnaires. These platforms were considered the most appropriate as the potential respondents would have, at the very least, a basic understanding of Bitcoin and its various uses. Similar platforms (social media groups and Bitcoin forums) were used by Sas and Khairuddin (2017) in their study on exploring the challenges and opportunities of Bitcoin users. In addition to using those platforms, those researchers also resorted to snowball sampling to increase their sample size.

In a study conducted on the adoption of Bitcoin in businesses, the researchers also utilized online Bitcoin communities and resorted to non-probability convenient sampling (Wood et al., 2017).

The questionnaire was electronic and was made available online using Google forms. Section A of the questionnaire requested demographic information from the respondent including how they currently utilize Bitcoin and where they currently reside. Care was taken to ensure that all respondents reside in South Africa as the questionnaire automatically ended if a respondent indicated that they are not from South Africa. Section B consisted of questions developed for the hypotheses being examined and were measured using a 5-point Likert-type scale with markers ranging from "1-strongly disagree" to "5-strongly agree". The survey was completed by 204 respondents.

The hypotheses being examined appear in Table 1.

Table 1. Hypotheses developed from the research model

H1: Perceived Usefulness will have a positive influence on behavioral intention to use Bitcoin.
H2: Perceived Ease of Use will have a positive influence on behavioral intention to use Bitcoin.
H3: Subjective Norms will have a positive influence on behavioral intention to use Bitcoin.
H4: Trust will have a positive influence on behavioral intention to use Bitcoin.
H5: Facilitating conditions will have a positive influence on behavioral intention to use Bitcoin.

H6: Age will positively moderate the influence of perceived usefulness on behavioral intention to use Bitcoin for younger individuals.
H7: Gender will positively moderate the influence of perceived usefulness on behavioral intention to use Bitcoin.
H8: Income will positively moderate the influence of perceived usefulness on behavioral intention to use Bitcoin.
H9: Age will positively moderate the influence of perceived ease of use on behavioral intention to use Bitcoin for younger individuals.
H10: Gender will positively moderate the influence of perceived ease of use on behavioral intention to use Bitcoin.
H11: Income will positively moderate the influence of perceived ease of use on behavioral intention to use Bitcoin for younger individuals.
H12: Age will positively moderate the influence of subjective norms on behavioral intention to use Bitcoin.
H13: Gender will positively moderate the influence of subjective norms on behavioral intention to use Bitcoin.
H14: Income will positively moderate the influence of subjective norms on behavioral intention to use Bitcoin.
H15: Age will positively moderate the influence of trust on behavioral intention to use Bitcoin.
H16: Gender will positively moderate the influence of trust on behavioral intention to use Bitcoin.
H17: Income will positively moderate the influence of trust on behavioral intention to use Bitcoin.
H18: Age will positively moderate the influence of facilitating conditions on behavioral intention to use Bitcoin.
H19: Gender will positively moderate the influence of facilitating conditions on behavioral intention to use Bitcoin.
H20: Income will positively moderate the influence of facilitating conditions on behavioral intention to use Bitcoin.

FINDINGS

DEMOGRAPHIC PROFILE OF RESPONDENTS

Table 2 illustrates the demographic profile of the respondents. As can be deduced, the majority of respondents were well-educated, younger males falling within the middle to higher income earnings bracket.

The results suggest that there is gender bias towards the use of Bitcoin with 79% of users being male. This finding is consistent with the findings of Wood et al. (2017) and Tveita and Borander (2018) where 97.5% and 81% of the respondents were males respectively. Several other studies, including Schuh and Shy (2015), Bohr and Bashir (2014), and Sas and Khairuddin (2017), concluded the vast majority of respondents in their respective studies were male. In a survey conducted in the USA in 2019, it was reported that twice the number of males owned cryptocurrency compared to females (de Best, 2021).

The users of Bitcoin were generally younger with 75% of the respondents indicating that they were younger than 40 years of age. This result is consistent with Wood et al. (2017) where it was reported that the majority of the users fell into the 26-38 age category.

Table 2. Demographic profile of respondents

	Number	%
Gender		
Male	161	79%
Female	43	21%
Age		
18-25 years	55	27%
26-40 years	98	48%
41-50 years	27	13%
Over 50 years	24	12%
Education		
Primary	0	0%
Secondary	10	5%
Tertiary	194	95%
Income		
< ZAR10 000	0	0%
ZAR10 000 – ZAR19 999	23	11%
ZAR20 000 – ZAR29 999	77	38%
ZAR30 000 – ZAR39 999	87	43%
> ZAR40 000 -	17	8%
Knowledge and understanding of Bitcoin		
None	0	0%
Basic	16	8%
Intermediate	145	71%
Extensive	43	21%

The data collected suggest that South African users of Bitcoin fall into the middle to higher income bracket. These statistics are similar to Arias-Oliva et al. (2019) who concluded that the income levels of current users of Bitcoin were quite high when compared to the average individual. Regarding knowledge and understanding of Bitcoin, 75% of the respondents indicated that they have, at the very least, intermediate knowledge of Bitcoin.

Analysis of the Quality of the Data Collected

Reliability test

In order to ascertain the reliability and internal consistency of the data, the Cronbach alpha reliability test was conducted. It must be noted that the higher the Cronbach alpha coefficient (α), the more reliable the item is believed to be. The resulting α coefficient of reliability ranges from 0 to 1 in providing this overall assessment of a measure's reliability. The results of the Cronbach alpha reliability test for each construct appear in Table 3. The alpha values for each construct reflected in Table 3 exceed 0.7, which is indicative of high internal consistency. The research instrument, therefore, displays a high degree of reliability and integrity.

Normality test

A normality test was conducted on the Likert scale data collected. This test determines if the data collected is consistent with a normal distribution. As a rule of thumb, if the variables are normally distributed, a linear regression and Pearson correlation test will be conducted, but if not, an ordinal logistic regression and Spearman rank correlation test should be conducted (Mukaka, 2012). In this

study, we rely on the Kolmogorov-Smirnov normality test since the number of respondents is more than 50. To check if the data is normally distributed, the p-value should be greater than 0.05. The results of the Kolmogorov-Smirnov normality test are presented in Table 4. The results indicate that all the data are not normally distributed. This implies that ordinal logistic regression is most suitable for this dataset.

Table 3. Cronbach alpha scores

Construct	Cronbach Alpha
Perceived Usefulness (PU)	0.78
Perceived Ease of Use (PEOU)	0.79
Subjective Norms (SN)	0.82
Trust (TR)	0.84
Facilitating Conditions (FC)	0.72

Table 4. Results of normality test

	Kolmogorov-Smirnov[a]		
	Statistic	Df	Sig.
Perceived usefulness	.186	204	.000
Perceived ease of use	.301	204	.000
Subjective norms	.170	204	.000
Trust	.171	204	.000
Facilitating conditions	.277	204	.000
log_ Perceived usefulness	.154	204	.000
log_ Perceived ease of use	.289	204	.000
log_ Subjective norms	.138	204	.000
log_ Trust	.159	204	.000
log_ Facilitating conditions	.263	204	.000

Multicollinearity tests

Multicollinearity occurs when independent constructs in a regression model are correlated. If the degree of correlation is high enough, model fit and interpretation of results could be compromised. In addition to the above, the power of a model to identify independent variables that are statistically significant is reduced. For this study, Spearman's rank-order correlation was utilized. This specific method was chosen due to the constructs being ordinal. As noted by Mukaka (2012), a Spearman's rank correlation test is more appropriate when one or both variables are skewed or ordinal. The results of this test are found in Table 5. The result of the Spearman's rank correlation for the users of Bitcoin indicates that there is a positive relationship between intention to use Bitcoin and perceived ease of use, trust, facilitating conditions, and income, while age, gender, perceived usefulness, and subjective norms exhibited a negative relationship with intention to use Bitcoin. The correlation coefficient for the users of Bitcoin based on the result indicates that the highest correlation was 0.78. The results indicate that there was no problem with multicollinearity since the correlation coefficients were less than 0.90.

Table 5. Results of the Spearman's rank-order correlation

	Intention	PU	PEOU	SN	TR	FC	Age	Income	Gender
Intention	1.0000								
PU	-0.1000	1.0000							
PEOU	0.1489	0.0232	1.0000						
SN	-0.0438	0.4353	0.0184	1.0000					
TR	0.4576	-0.1090	0.3524	-0.1247	1.0000				
FC	0.2472	-0.0118	0.4026	-0.0424	0.7834	1.0000			
Age	-0.0317	0.0523	-0.3881	0.0451	-0.3905	-0.4758	1.0000		
Income	0.3118	0.0293	-0.0954	0.0774	-0.1965	-0.1487	0.3332	1.0000	
Gender	-0.5646	0.0084	0.0051	0.0041	-0.3407	-0.1356	-0.1825	-0.0301	1.0000

To further confirm that multicollinearity is insignificant for this study, additional tests were conducted and include Tolerance, VIF (Variance Inflation Factor), and CI (Condition Index). The VIF identifies a correlation between independent constructs in a model and the strength of that correlation. If the VIF is greater than 5 and the tolerance is less than 0.2, there is an element of multicollinearity among the variables (Kim, 2019). In the extreme, if the tolerance is close to zero and VIF is higher than 10, there is an indication of a high degree of multicollinearity in the model (Kumari, 2008). The findings of this study with respect to users of Bitcoin based on the VIF and tolerance indicate the absence of multicollinearity as depicted in Table 6. This is because the VIF for all the variables ranged between 1.16 and 4.0 and are less than 5. The tolerance values calculated in the current study ranged between 0.24 and 0.86. This implies that there is no problem with multicollinearity in terms of tolerance and VIF values.

Table 6. Collinearity diagnostics

Variable Squared	VIF	SQRT VIF	Tolerance	R-squared		Eigenval	Condition Index (CI)
Intention	2.52	1.59	0.3969	0.6031	1	5.9994	1.0000
PU	1.16	1.08	0.8598	0.1402	2	1.6907	1.8838
PEOU	1.96	1.40	0.5091	0.4909	3	1.0401	2.4017
SN	1.18	1.08	0.8510	0.1490	4	0.7630	2.8042
TR	4.00	2.00	0.2498	0.7502	5	0.3843	3.9510
FC	3.01	1.73	0.3326	0.6674	6	0.0573	10.2284
Age	2.72	1.65	0.3673	0.6327	7	0.0388	12.4393
Income	1.62	1.27	0.6154	0.3846	8	0.0215	16.7103
Gender	2.48	1.57	0.4032	0.5968	9	0.0039	39.1297
Mean VIF	2.30				10	0.0010	75.9406
Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)					Condition Number		75.9406
Det (correlation matrix) 0.0272							

Confirmatory factor analysis

For this study, the presence of construct validity was assessed by conducting a confirmatory factor analysis (CFA). The CFA is a measurement model used to study the relationships between a set of observed variables and latent variables. Amongst several model fit indices, the root mean square error

of approximation (RMSEA), comparative fit index (CFI), and Tucker–Lewis index (TLI) are widely used in the literature. Table 7 presents the overall model level fit indices for this study.

Table 7. Model fit indices

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms (251)	504.736	model vs. saturated
p > chi2	0.000	
chi2_bs (325)	4564.414	baseline vs. saturated
p > chi2	0.000	
Population error		
RMSEA	0.070	Root mean squared error of approximation
90% CI, lower bound	0.061	
upper bound	0.079	
pclose	0.000	Probability RMSEA <= 0.05
Information criteria		
AIC	5642.918	Akaike's information criterion
BIC	6054.364	Bayesian information criterion
Baseline comparison		
CFI	0.940	Comparative fit index
TLI	0.923	Tucker-Lewis index
Size of residuals		
SRMR	0.072	Standardized root mean squared residual
CD	0.245	Coefficient of determination

The chi-square goodness of fit test is statistically significant (χ^2 (251) = 504.74; p<0.05). This implies that the estimated model is not an exact fit to the data. However, we consider other model fit indices before we can conclude the fitness of the model. The RMSEA of 0.07 is within the acceptable range. The CFI of 0.94 is greater than the cut-off of 0.9 and the TLI of 0.92 is also marginally higher than the cut-off of 0.90. This implies an acceptably fit model. Furthermore, the SRMR of 0.07 is less than the cut-off of 0.8. Combining all the model fit indices, the model is acceptable as the majority of the model fit indices suggest that the model is adequately fit.

Ordinal logistic regression

Using ordinal logistic regression, 7 models were estimated. The base model (model 1) examined the influence of perceived usefulness, perceived ease of use, subjective norms, trust, and facilitating conditions on intention to use Bitcoin. Models 2 to 6 accounted for the individual effects of the moderating variables age, gender and income while model 7 accounted for the joint effect of all the three moderating variables. The logit coefficients are in log-odds units and cannot be interpreted as regular ordinary least square coefficients. To interpret the coefficients, the odd ratios were estimated and are presented in Table 8. The dependent variable (intention to use Bitcoin) has 5 categories (strongly agree-5, agree-4, neutral-3, disagree-2, and strongly disagree-1). The Prob > Chi^2 is used to determine whether all the coefficients in the model are a value other than zero. The decision rule is if Prob > Chi^2 < 0.05, we can conclude that the models have some relevant explanatory power. From the results, the likelihood ratio (LR) Chi^2 of 22.11, 25.09, 58.1, 104.11, 58.27, 108.18, and 190.13 for models 1-7 respectively, and Prob > Chi^2 for the 7 models are less than 0.05, we can therefore conclude that the models have some relevant explanatory power.

Looking at the Pseudo R^2 for the 7 models estimated, which ranges between 0.08 and 0.90, it can be concluded that, while the inclusion of all constructs and moderating variables has relevant explanatory power, other factors influence the intention to use Bitcoin not accounted for in the model. It is also clear that perceived ease of use is statistically significant in models 4, 6, and 7 at the 5% and 1%

level of significance respectively while trust is statistically significant in models 1-6 at the 5% and 1% level of significance respectively.

DISCUSSION

Model 1 was estimated to address hypotheses 1-5, as detailed in Table 1, which are based on testing if perceived usefulness, perceived ease of use, subjective norms, trust, and facilitating conditions have a positive influence on behavioral intention to use Bitcoin. The results, as presented in Table 8, indicates that trust positively influences behavioral intention to use Bitcoin and is statistically significant. This is because the p-values for trust are less than 0.05. This then implies that the odds of the intention (strongly agree and agree) to use Bitcoin compared to the other constructs are 2.096 higher for users of Bitcoin based on trust, given that all of the other variables in the model are held constant. This finding is consistent with the results of a study by Sas and Khairuddin (2017). In their study, the authors concluded that the users of Bitcoin indicated that they have strong technological trust in Bitcoin and blockchain technology. In a study on consumer adoption of cryptocurrencies, Mahomed (2017) concluded that trust plays a significant role in a user's intention to use Bitcoin. Considering the large number of security breaches and scams that many users have fallen victim to, it is no surprise that trust is an essential determinant of Bitcoin adoption. Consumer protection in the context of crypto exchanges could lead to individuals increasing their trust in the Bitcoin environment which will ultimately lead to greater adoption of cryptocurrencies. Walton and Johnston (2018), and Jankeeparsad and Tewari (2018) also concluded that trust influences intention to use Bitcoin.

Table 8. Ordinal logistic regression results – odd ratio

	Model 1 Intention	Model 2 Intention	Model 3 Intention	Model 4 Intention	Model 5 Intention	Model 6 Intention	Model 7 Intention
PU	.991	.996	.988	.954	.987	.942	.962
	(.156)	(.158)	(.176)	(.176)	(.177)	(.177)	(.308)
PEOU	.87	.872	.994	.566**	.987	.523***	.407**
	(.179)	(.184)	(.239)	(.133)	(.24)	(.129)	(.185)
SN	.972	.96	.889	1.052	.888	1.113	.985
	(.249)	(.247)	(.251)	(.329)	(.252)	(.36)	(.432)
TR	2.096***	2.637***	2.57***	2.524***	2.738***	1.91**	1.586
	(.58)	(.808)	(.723)	(.714)	(.88)	(.605)	(.715)
FC	1.339	1.355	1.453	1.166	1.455	1.07	.415
	(1.03)	(1.055)	(1.24)	(1.044)	(1.24)	(.948)	(.645)
Age		1.446*			1.103	.588**	.049***
		(.313)			(.265)	(.157)	(.036)
Income			3.654***		3.587***		95.274***
			(.898)		(.895)		(83.857)
Gender				0.000		0.000	0.000
				(0.000)		(0.000)	(0.000)
/cut1	2.296	4.952	193.011	.848	223.58	.217	28.276
	(6.975)	(15.369)	(686.685)	(2.997)	(799.287)	(.773)	(190.169)
Observations	204	204	204	204	204	204	204
Pseudo R^2	.079	.089	.207	.370	.207	.385	.676
LR $chi^2(6)$	22.11	25.09	58.1	104.11	58.27	108.18	190.13
Prob > chi^2	0.0000	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000
Log likelihood	-129.5533	-128.0614	-111.5546	-88.5515	-111.4711	-86.5165	-45.5424

Standard errors are in parentheses
*** p<.01, ** p<.05, * p<.1

Models 2-4 account for the moderating effects (Hypotheses 6-20) of age, gender, and income on perceived usefulness, perceived ease of use, subjective norms, trust, and facilitating conditions with respect to their intention to use Bitcoin. As noted earlier, Bohr and Bashir (2014), Novendra and Gunawan (2017), Schuh and Shy (2015) opined that age and gender do influence the use of Bitcoin. The results of this study indicate that, in the case of South African users, only age and income significantly influence the intention to use Bitcoin. This is because the p-value for age in model 2 and income in model 3 are less than 0.1 and 0.01 respectively as illustrated in Table 8. This then implies that the odds of a higher intention to use Bitcoin are significantly greater for respondents within the age bracket 26–40 years by a factor of 1.446 than the odds for other age brackets when other variables were held constant.

The results further indicate that gender does not significantly influence an individual's intention to use Bitcoin, but it does significantly moderate the influence of perceived ease of use and trust on behavioral intention to use Bitcoin. This is contrary to the results of other Bitcoin adoption studies such as Bohr and Bashir (2014), Novendra and Gunawan (2017), and Schuh and Shy (2015), where it was concluded that gender significantly influences intention to use Bitcoin. The key difference here could be due to the fact that those studies were conducted while Bitcoin was a relatively new concept and was still in its early stage of adoption. Now, in 2022, Bitcoin is at a more advanced stage of acceptance and is easily accessible via the various exchanges available in South Africa. A key finding here is that while the majority of the respondents in this study were male, the results suggest that gender does not play a significant role in an individual's intention to use Bitcoin in South Africa.

The results indicate that another important variable that influences the intention to use Bitcoin is income, which was statistically significant in models 3, 5, and 7. The findings of this study revealed that the odds of intention to use Bitcoin increase as the income of an individual increase. This significant finding then implies that the odds of a higher intention to use Bitcoin increases (decreases) as income increases (decreases). This finding correlates with Mahomed (2017) who also reported that cryptocurrency holders are generally younger, affluent individuals.

Models 5-7 test for the joint effects of age, gender, and income on perceived usefulness, perceived ease of use, subjective norms, trust, and facilitating conditions. Specifically, model 5 tests for the joint effect of age and gender, model 6 tests for the joint effect of age and income while model 7 tests for the combined effect of age, gender, and income with respect to intention to use Bitcoin. The results indicate that only income was significant in model 5 at the 1% level of significance, while age was significant in model 6 at the 5% level of significance. In model 7, both age and income were significant at the 1% significance level. This is because the p-value for age and income are both less than 0.01. Model 7 suggests that perceived ease of use has a significant influence on intention to use Bitcoin. When it comes to ease of use, the odds of the intention (strongly agree and agree) to use Bitcoin compared to the other categories are 0.407 greater for users of Bitcoin given that all the other variables in the model are held constant. This, therefore, implies that 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 (2017), Sas and Khairuddin (2017), Wood et al. (2017), and more recently Arias-Oliva et al. (2019). These studies conclude that ease of use has a positive significant influence on intention to use Bitcoin. Table 9 lists the findings with regard to each of the hypotheses investigated.

Table 9. Analysis of hypotheses

Hypotheses	Positive influence on BI?	Statistically significant?
H1: Perceived usefulness will have a positive influence on behavioral intention to use Bitcoin.	Yes	No
H2: Perceived ease of use will have a positive influence on behavioral intention to use Bitcoin.	Yes	No
H3: Subjective norms will have a positive influence on behavioral intention to use Bitcoin.	Yes	No
H4: Trust will have a positive influence on behavioral intention to use Bitcoin.	Yes	**Yes**
H5: Facilitating conditions will have a positive influence on behavioral intention to use Bitcoin.	Yes	No
H6: Age will positively moderate the influence of perceived usefulness on behavioral intention to use Bitcoin for younger individuals.	Yes	No
H7: Gender will positively moderate the influence of perceived usefulness on behavioral intention to use Bitcoin.	Yes	No
H8: Income will positively moderate the influence of perceived usefulness on behavioral intention to use Bitcoin.	Yes	No
H9: Age will positively moderate the influence of perceived ease of use on behavioral intention to use Bitcoin for younger individuals.	Yes	No
H10: Gender will positively moderate the influence of perceived ease of use on behavioral intention to use Bitcoin.	Yes	**Yes**
H11: Income will positively moderate the influence of perceived ease of use on behavioral intention to use Bitcoin for younger individuals.	Yes	No
H12: Age will positively moderate the influence of subjective norms on behavioral intention to use Bitcoin.	Yes	No
H13: Gender will positively moderate the influence of subjective norms on behavioral intention to use Bitcoin.	Yes	No
H14: Income will positively moderate the influence of subjective norms on behavioral intention to use Bitcoin.	Yes	**Yes**
H15: Age will positively moderate the influence of trust on behavioral intention to use Bitcoin.	Yes	**Yes**
H16: Gender will positively moderate the influence of trust on behavioral intention to use Bitcoin.	Yes	**Yes**
H17: Income will positively moderate the influence of trust on behavioral intention to use Bitcoin.	Yes	No
H18: Age will positively moderate the influence of facilitating conditions on behavioral intention to use Bitcoin.	Yes	No
H19: Gender will positively moderate the influence of facilitating conditions on behavioral intention to use Bitcoin.	Yes	No
H20: Income will positively moderate the influence of facilitating conditions on behavioral intention to use Bitcoin.	Yes	No

Bitcoin Use in South Africa

Prior research into the main uses of Bitcoin concludes that the cryptocurrency is utilized as:

- Payment method (digital currency);
- An investment in the crypto-asset class, or
- As a speculative instrument for profit-making (short-term trading)

The results of this study, as depicted in Figure 7, indicate that 87 respondents (43%) and 117 respondents (57%) currently utilize Bitcoin as an investment in the crypto-asset class and as a speculative instrument for profit-making respectively. No users indicate that they use Bitcoin as a payment method even though 98% of the respondents indicated that they are aware that Bitcoin can be used as a payment method. These results correlate with the findings by Glaser et al. (2014), Athey et al. (2016), Sas and Khairuddin (2017), Mahomed (2017), and Baur et al. (2018). All these studies report that users of Bitcoin are not primarily interested in it as an alternative payment method, instead, they are seeking to engage in profit-making and utilizing their Bitcoin holdings as an alternative

investment method. The reported usage supports the findings by Carr et al. (2015), that due to price volatility and the potential for speculative investing, users would rather trade Bitcoin than use it for transactional purposes. The authors go on to conclude that as price volatility decreases, the speculative attraction of Bitcoin should also decrease which will increase the use and adoption of the cryptocurrency for transactional reasons (Carr et al., 2015). Currently, the majority of South African holders of cryptocurrency have an investment motive behind their holdings and have no intention of utilizing it as a transactional medium.

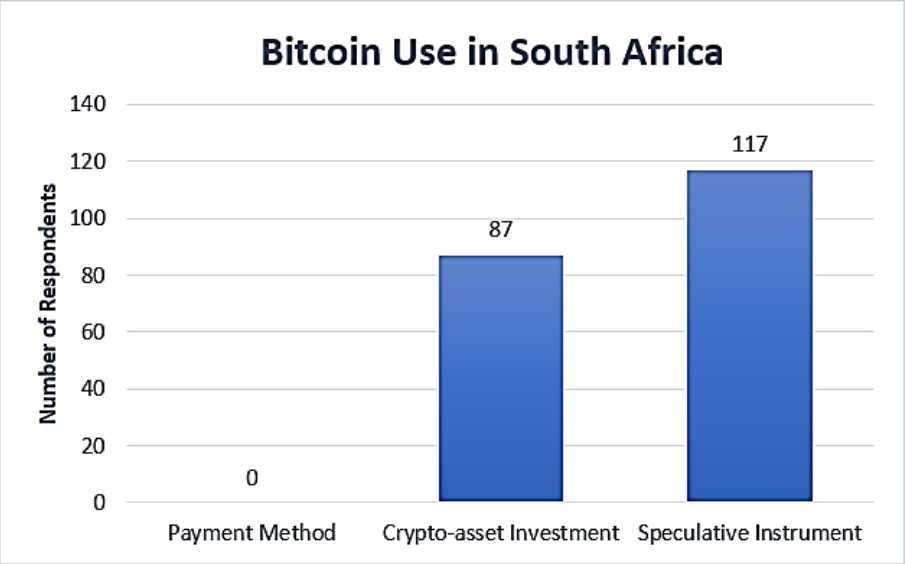

Figure 7. Bitcoin use in South Africa

CONCLUDING REMARKS

The Fourth Industrial Revolution has led to new technologies that will forever change the way we live, work and transact. The development of Bitcoin has led to the disruption of the traditional financial sector with regulatory authorities the world over struggling to keep abreast. Whilst operating in a regulatory void, Bitcoin has led to the financial freedom of many individuals around the world, South Africa included. The market volatility that has become synonymous with Bitcoin has led to its increased adoption by individuals seeking financial gains. This study set out to determine the factors influencing Bitcoin adoption in South Africa and to determine how Bitcoin is currently utilized by its advocates. The results revealed that trust has a significant influence on behavioral intention to use Bitcoin. It was also determined that age and gender will positively moderate the influence trust has on behavioral intention to use Bitcoin. The results also indicated gender positively moderates the influence of perceived ease of use on behavioral intention to use Bitcoin and income will positively moderate the influence of subjective norms on behavioral intention to use Bitcoin. Regarding Bitcoin use in South Africa, current adopters are utilizing cryptocurrency as a speculative instrument and as a long-term investment. The nature of this study, including the methodology utilized, has limitations. Firstly, survey research was conducted, and the results are dependent on the honesty of the respondents. Generally, individuals would gravitate toward more socially desirable responses as opposed to undesirable responses. This study is cross-sectional in nature. Cryptocurrency and its use cases are constantly evolving, and so will users' perceptions of the phenomenon. The study is limited to South African Bitcoin holders and as such the results cannot be generalized to other countries as there may be additional, unique factors, that influence adoption in different regions. Bitcoin, and cryptocurrency in general, is an area that presents various research opportunities. It is recommended that further studies are conducted to investigate the factors influencing Bitcoin adoption by

businesses as an alternate payment method. Research should also be conducted to compare the current and proposed crypto regulations across the world and to investigate methods that revenue authorities can utilize to identify and tax cryptocurrency gains.

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