



Benefits and Risks Associated With the Use of Blockchain and Cryptocurrency as a Form of Payment in Ghana: A Case Study of Selected Bitcoin Trading Companies

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ABSTRACT

This paper analyses the use of blockchain and cryptocurrency as a payment system in Ghana. It made use of three (3) selected cryptocurrency companies in Ghana through a narrative qualitative research approach. Respondents were sampled through convenience sampling and snowballing. The findings indicated that accepting the use of blockchain and cryptocurrency as a mode of payment in Ghana can help address the implications of alternative finance upon money creation and distribution. Non-banks, such as peer-to-peer lenders, are competing with banks and taking on a larger share of total lending. This has implications for money creation and distribution. The findings also showed that there is a bright future for cryptocurrency even though its outlook is still very much in question. This study also highlighted that the main risk cryptocurrency poses on Ghana's economy is that cryptocurrency is used for criminal activities, because it is not being supervised by financial institutions. It is recommended that the Ghanaian Government embarks on an inclusive approach to the exploration of digital currency that provides sufficient opportunity for public input and policy review.

Keywords: blockchain, cryptocurrency, bitcoin, trading

I. INTRODUCTION

Many countries have long strived to increase national participation in the digital economy. In the case of Ghana, formal efforts to improve the legislative and technological infrastructure to facilitate e-commerce dates back to 2003 according to the Ghana ICT for accelerated development. In the ensuing eighteen years, however, progress has been slow and the challenge

continues to engage the attention of national authorities. There is need for a more effective enabling environment that supports the efforts of small and medium enterprises (SMEs) to provide ecommerce services (Naab & Bans-Akutey, 2021). The e-commerce sector has faced, both in Ghana, and throughout the African continent, difficulties surrounding banking and the use of electronic payment systems.

According to Salma et al, (2019) new technologies are emerging that have the potential to address this deficit in electronic payment infrastructure. Digital currency and mobile money solutions are components of new industry classifications referred to as Financial Technology (FinTech) and Digital Financial Services (DFS). These technologies are swiftly evolving, and it will take some time before they reach maturity and generate widespread usage. In response, even at this early stage, regulators in financial capitals around the world, including New York, London and Singapore are all examining ways to enable the technological innovation offered by digital currency and related technologies, while putting measures in place to mitigate a number of risks that have been associated with their broader adoption.

Governments in African countries would be well-served to follow a similar approach, but many have limited awareness of these technologies. Others harbor deep concerns about the risks associated with digital currencies (Erts & Boily, 2019). Some policy makers may be inclined to push for an outright ban on



cryptocurrency technologies, or at least a delay in their adoption for an extended period of time. However, the global and decentralized nature of cryptocurrency means that this course of action would unlikely be effective. It could also come at a high cost to African innovators, foreclosing a potential avenue for economic growth.

Electronic money is not a new phenomenon. Trade over the Internet has increased the use of new technologies, thereby increasing the demand for new electronic payment methods. What really is new is electronic payment in retail and use of the Internet as new monetary market. Today, money becomes ready information on the microprocessor or in the database. Without a doubt, the purpose of such an instrument is to improve the efficiency of the traditional payment method. At this moment, there are still no clear standards in the cryptocurrency mechanism and therefore there are no known boundaries, so participants can easily communicate without the presence of a regulator. Behind Blockchain technology is the universal internet currency, which in turn raises many questions about the utilization of the advantages and risks/damages that would be arisen from the application (Boshcov, 2018).

High-tech enables payment evolution and global competition. But still the ambiguities surrounding the use of the blockchain and cryptocurrency leave enough space for the analysis of its unreserved acceptance, trust and anticipation, which are the main drivers for the spread of the network. More precisely, the spread of the network requires interdependence of demand, which means the network, must reach the minimum required volume before it reaches a balance.

With the growing popularity of the crypto market, the large number of unregulated cryptocurrencies (several hundreds), greater attention is now being paid by governments and other stakeholders around the world. Illustrative is that the total market capitalization of the 100 largest cryptocurrencies is reported to exceed the equivalent of EUR 330 billion (GHC 22.3 trillion) globally by early 2018 (Houben & Snyers, 2018). The total market capitalization of all cryptocurrencies together in that period peaked at an even higher USD 728 billion, (GHC 4.9 trillion) dropping just three weeks later to approximately USD 360 billion (GHC 2.4 trillion).

Regulators are looking at whether and how to regulate cryptocurrencies. Until now there is no univocal view

on how to do that. In any event, there are compelling reasons why cryptocurrencies should be under more scrutiny by regulators and supervisors. The threat of price volatility, speculative trading, hack attacks, money laundering and terrorist financing all call for stricter regulation. According to Shiva (2016), a major problem aside the instability of cryptocurrency prices, is that cryptocurrencies have a lot of regulatory oversight and this has led to an increase in illegal activity and illegitimate use. Aside the instability of cryptocurrency prices, regulators are worrying about criminals who are increasingly using cryptocurrencies for activities (trading away from official channels) like fraud and manipulation, tax evasion, hacking, money laundering and funding for terrorist activities. It is the reason why it is not accepted as a form of payment in many parts of the world. This is all as a result of weak regulatory measures in place. Therefore, this study explores the benefits and risks associated with the use of Blockchain and Cryptocurrency as a form of payment in Ghana. The specific objectives therefore are:

1. To identify the opportunities of cryptocurrency and blockchain to Ghana's economy
2. To examine the risks the use of cryptocurrency and blockchain poses to Ghana's economy.
3. To examine the impact of potential acceptance of cryptocurrency and blockchain as a payment method on the Ghanaian economy.
4. To explore the future of cryptocurrency and blockchain in Ghana

II. LITERATURE REVIEW

The notion of cryptocurrency has been explored in a variety of areas and contexts, including economics, sociology, political sciences, and humanities (Swan, 2015; Huckle & White, 2016) To define this concept, the European Parliament has recently produced a document classifying the definitions provided by various organizations, including the European Central Bank, the International Monetary Fund, the Committee on Payments and Market Infrastructures (a constituent of the Bank for International Settlements), the European Banking Authority, and the World Bank. The common conclusion of these different institutional viewpoints is that there is no generally accepted and regulated definition of cryptocurrency. Nevertheless, the majority of these jurisdictions view cryptocurrency as a subset,



or a form of virtual currencies, also called digital currencies (Houben & Snyers, 2018).

At the most basic level cryptocurrency-digital currency or virtual currency-is a medium of exchange that functions like money (in that it can be exchanged for goods and services) but, unlike traditional currency, is untethered to, and independent from, national borders, central banks, sovereigns, or fiats (Maese et al., 2016). Cryptocurrencies exist solely in the digital world. For this reason, and because of the neutral connotations associated with it, “digital currency” is generally preferred over “virtual currency.” In fact, “virtual” denotes negativity because it signals something that is “seemingly real” but not exactly “real” when referring to a currency that is stored in a “digital” or “electronic register” (Twesige, 2015).

History of top 5 cryptocurrencies

Bitcoin

One of the biggest financial stories of the past year has been the incredible raise of bitcoin. The virtual currency was designed to revolutionize peer-to-peer transactions. Although bitcoin was the first established cryptocurrency, there have been previous attempts at creating online currencies with ledgers secured by encryption. Two examples of these were B-money and Bit gold, which were formulated but never fully developed. In the year 2008, a paper called Bitcoin A Peer to Peer Electronic cash system was posted on the internet about cryptography. In 2009, the bitcoin software was made available to the public for the first time. First time value for the Bitcoin was as it had never been traded, only mined, it was impossible to assign a monetary value to the unit of emergency cryptocurrency. In 2010, someone decided to sell theirs for the first time swapping 10,000 of them for two pizzas.

Etherium

Buterin (2013) initially developed the concept. It came about a result of his work and research into the Bitcoin community. He initially published the Ethereum white paper, describing the technical design of Ethereum and the protocol. To put it simply the goal of Ethereum is to use a blockchain, which will replace the third parties, including those that store data, transfer mortgages and keep a track of complex financial instruments. Smart contract are the primary feature of Ethereum and self-executing programs that facilitate the exchange of

anything of value on the network, immutably stored on the blockchain. They execute when specific conditions are met and are outside the influence of third parties or censorship and no downtime, as long as the Ethereum network is functioning. The general ambition of the project outlined in the white paper as well as technical expertise of its young founder attracted the attention of many in the cryptocurrency space. The platform’s core innovation became known as the “Ethereum Virtual Machine” and is turning complete software that runs on the Ethereum network, enabling anyone to run any program, regardless of the programming language, on the Ethereum blockchain.

Ripple

Evidently, Ripple has developed to become one of the success stories in the crypto market, with several significant partnerships, developments and a large community behind it. Ripple was launched by Jed Mc Caleb, Christ -Larsen and Aruthur Britto back in 2012, and in less than six years, the platform has grown and managed to establish itself as a major player in the rapidly growing crypto industry. Global companies in different industries, especially financial institutions, have adopted the Ripple protocol massively. Ripple is a cryptocurrency that allows financial transactions of different currencies in the easiest way. In 2011 based on the idea of Ripple pay.com Jed Mc Caleb started working on new version of the Ripple system. The new network would not require mining to verify transactions. Mining is central feature of some of the largest Cryptocurrencies like Bitcoin. It is necessary to verify the validity of the transactions but take up time and electricity, as it requires computing power. In 2012 Christ- Larsen the founder of E-loan and prosper joined Mc Caleb and they approached Ryan Fugger together. Fugger allowed the other two to take over the process and in 2012, the team opened new corporation named open coin. Open coin would become the groundwork for Ripple. Open coin took it upon itself to create a payment network that allowed parties to transact between each other without wait time or additional fees.

Bitcoin cash

It is the version of Bitcoin in which the original properties of digital money still exist. Bitcoin cash (BCH) is an upgraded version of the Bitcoin core. It was released on August 1, 2017. The main grade offered by bitcoin cash is an increase of the block size limit to 8 MB. This effectively allows miners on the BCH bitcoin cash chain to process more payment per second. This makes for faster, cheaper transactions and



a much smoother user experience. Bitcoin cash is third form of bitcoin, the original Bitcoin block and an upper block size limit of 8 MB. Bitcoin cash is peer to peer electronic cash for the internet. It is fully decentralized, with no trusted third parties to operate. It is done by design because the primary motivation of bitcoin cash existence depends solely on carrying out more transaction. Bitcoin cash (BCH) is lot like Bitcoin but has some very noticeable differences are as follows: The block size is 8 MB; It won't have segwit; It won't have the replace by fee feature; It won't have replay and wipeout protection; It offers a way to adjust the proof of work difficulty quicker than the normal block difficulty adjustment interval found in Bitcoin.

Tether

Tether is Blockchain based Cryptocurrency, whose cryptocurrencies in circulation are backed by an equivalent amount of traditional fiat currencies, like the Dollar, the Euro or the Japanese Yen, which are held in a designated bank account. Tether, as it is known today, was launched in November 2014, after it was rebranded from the original project Real coin. The project was initially founded by Bitcoin foundation director Brock Pierce, alongside software engineer Craig Sellars, and Entrepreneur Reeve Collins. The Real coin start up laid the foundation for Tether's operation before the name change came about.

The premise of Cryptocurrency was simple to provide a utility token that represented certain fiat currencies at 1:1 ratio, with the benefits of cross border payment facilitate by blockchain technology. The cryptocurrency was built and operated using Omnilayer platform, a software layer built on the Bitcoin protocol. Thus every time new Tether tokens were issued, these could be tracked on the problem, allowing the wider crypto currency community to keep tabs on how many new Tether were released. Tether, a crypto currency that has long been a point of contention in the community, has seemingly been unpegged from the US Dollar. The stable coin, by virtue of that very description, was linked to the US Dollar at a 1:1 ratio. Simply put, every Tether token that was minted has to be backed by a US Dollar. Tether belongs to a new breed of cryptocurrencies called stable coins that aims to keep Cryptocurrency valuation stable as opposed to the wide swigs observed in the prices of other popular cryptocurrencies like Bitcoin and Ethereum. That would allow it to be used as a medium of exchange and a mode of storage of value.

Blockchain technology

With the rapid growth in cryptocurrencies, the blockchain becomes an underlying technology that has attracted a lot of attention. Primarily known for its use with digital currency, this technology has various applications that extend way beyond the financial and economic realm, including supply chain management, trade, health, and government services (Ghilal & Nach, 2019). Technically, blockchain is a decentralized and secure database of transactions based on decentralized nodes (Glaser, 2017). It is characterized by decentralization, persistency, anonymity, and auditability. Decentralization means that each transaction needs to be validated but the validation process does not occur through a central trusted agency like a central bank, but through a consensus algorithm to maintain data consistency in a distributed network (Zheng et al., 2017). Persistency means that it is impossible to delete or rollback any transaction once it is included in the blockchain. However, invalid transactions can be discovered immediately, making the persistency characteristic not too much of a drawback overall. Anonymity means that each user can interact with the blockchain in a generated address without revealing the user's real identity (Kosba et al., 2016). Finally, auditability means that any transaction has to refer to a previous unspent transaction (Nakamoto, 2008). Therefore, transactions can be easily verified and tracked.

Furthermore, there are four blockchain types according to characteristics such as "public or private" and "with or without permission" In a "permissionless" (without permission) blockchain (e.g., Bitcoin), anyone can operate a node and participate through spending central processing unit (CPU) cycles (i.e., the time required for the execution of one simple machine instruction such as an addition or a subtraction (Encyclopedia, 2019) and demonstrating "proof-of-work (PoW)" (Cachin, 2016), which is a consensus strategy or algorithm used in the validation processes of hashes or blocks (Nakamoto, 2008). Given that in a decentralized network such as the blockchain, someone has to be selected to record the transactions. There are multiple strategies for selecting that person, who is typically a miner. The easiest way, also used in PoW, is random selection. However, this selection is vulnerable to attacks and requires a lot of energy due to the higher computing power needed to compute and recompute a hash value that cannot be attacked (Zheng et al., 2017). There are other consensus algorithms such as "proof-of-stake" (PoS) wherein miners have to prove the ownership of the amount of currency. Although tending to favor the users with the



most cryptocurrencies, PoS is a more energy-saving and efficient alternative to PoW. However, many blockchains adopt PoW first before moving to PoS (Zheng et al., 2017) On the other hand, blockchains in the “permissioned” (with permission) model verify who participates in the validation and in the protocol (Swanson, 2015) Besides, an important second characteristic of blockchain architecture relates to the property regime.

Reasons for Blockchain occurrence

Although cash is a quick and efficient payment method, the disadvantages of its use are numerous. Keeping cash is followed with many costs, including fraud, money loss, depositing, as well as the costs associated with managing money in financial institutions. The purpose of e-money is replacing the cash in transactions of small values, thus avoiding its shortcomings, for example French experience with Moneo. Moneo is designed to reduce the cost of keeping cash and purchasing power to be temporarily transferred in a more efficient manner. This structure should be applied to various retail transactions of lesser value in order to eventually become a substitute for cash.

Moneo offers great advantages for consumers and retailers. Benefits for consumers are: greater transaction speed and potential benefit in the form of a discount on future purchases. Consumers do not have to have an exact amount of cash each time. There will be many mistakes in cash recovery. The owners of the Moneo card should carry fewer bank cards, especially if the features of debit and credit cards are included, and thus they would feel more secure. Traders would receive cash before sending material goods or services, loyalty to customers would increase, and the process of payment at the place of purchase would be sped up, thereby reducing the processing costs of the transaction itself. If the benefit of using Moneo cards would be greater than the cost, retailers could pay to customers to use such a card.

A comparison between Moneo and POS turns out that the former has significant advantages over the POS. Namely, debit and credit cards are not as effective a payment method for low value transactions as transaction-related costs become higher for retailers and buyers, and e-money can be used with much lower costs. Paying for e-money is followed by much lower costs compared to other payment methods, primarily credit and debit cards. Another argument that accompanies the Moneo card is that it has a newer

encryption technology compared to other cards, which increases security and limits the possibility of fraud. Because Moneo does not require any authorization or identification of the buyer, it allows additional reduction in transaction costs. The new technology of digital payments and currencies will allow real property to be used as a means of exchange.

How much e-money will be used depends largely on the motivation of its publishers, consumers and traders. Consumers’ demand will depend on the advantages and disadvantages of e-money in the form of payment, issuers’ fees, consumer confidence in the use of e-money, ease of use, merchants’ readiness to accept e-money. Motivation for the issuers covers the revenues from the collected fee from card users (traders and consumers), income from investing the remaining amount of money, i.e. for banks—issuers, savings of less retained cash, in the range in which e-money replaces cash). Potential shortcomings for publishers can be expected costs for future regulation. The willingness of retailers to accept e-money is closely related to the fee that will be charged by publishers or operators. For consumers and retailers, the most important will be their willingness to embrace new technology. Most researchers believe that the use of e-money will be moderate in the short and medium term, while in the long run e-money can be very widespread.

Ghana’s regulatory environment

The Bank of Ghana has announced that the trading and use of cryptocurrency in Ghana is not yet legal because it is not recognized as a legitimate form of currency. This is because all media of exchange in the country must be supported by the Bank of Ghana, which has not yet approved the use of cryptocurrencies. However, the Bank of Ghana has drafted a Payment Systems and Services Bill (Ghanaian Bill), which it believes will enable the regulation of cryptocurrency in Ghana in the future. After a preliminary review of the Ghanaian Bill, there seems to be no reference to cryptocurrency, blockchain or digital currency though cryptocurrencies will apparently be regulated through companies registered with the government as “Electronic Money Issuers”. The Bank of Ghana has discouraged the use of cryptocurrency until the promulgation of the Ghanaian Bill.

Review of Related Studies

Shiva (2016) utilizes three main sources of data collection: a literature review of subregional and



international sources, a solicitation of views from experts in various fields engaged in the sphere of electronic payments, and a formal survey of the subregion's Central Banks regarding awareness of digital currency and mobile money in the evolving landscape of electronic payments. The report seeks to present Caribbean policy makers with information to begin the process of performing a balanced evaluation of opportunities and risks associated with digital currency in the Caribbean. The study finds that the Caribbean could benefit from innovations to payments technology. While digital currency and mobile money are technologies that could make a contribution in this area, their development is retarded by a reluctance to engage with them on the part of financial regulators. There is a need to expand the scope of participation in the regulatory process to include institutions that advocate for and promote innovation. The report examines the usage of digital currency technology in the Caribbean subregion with a view to drawing attention to the opportunities and risks associated with this new phenomenon. It discusses the broader context of an emerging activity at the global level and considers how this technology could address subregional deficiencies in the electronic payment infrastructure. The report also discusses mobile money solutions, and the relationship of that technology to digital currency.

Anas-Oliver et al, (2019) noted that the first commercial transaction with the first cryptocurrency in 2010 marked the start of a revolution in transactions. Blockchain and cryptocurrencies will dramatically transform how we do transactions, just as the Internet revolutionized how we communicate. Currently, more than 2,000 cryptocurrencies are quoted on the market, and many more are being launched in initial coin offerings for use as an exchange method in a specific business ecosystem or as rights to assets or liabilities. As an emerging fintech, cryptocurrencies open up many opportunities, but they also pose significant challenges and limitations. This paper analyzes the key factors for the successful development of a cryptocurrency from a consumer-behavior perspective. Using a technology acceptance theoretical framework, we test a model able to explain almost 85% of the intention to use cryptocurrencies. Surprisingly, risk was not a significant factor. This could be because most of the respondents considered operating with cryptocurrencies to be risky; the lack of variability in their responses to the questions about perceived risk would explain this lack of explanatory power. However, willingness to manage cryptocurrency risk could be a precondition for adoption. The performance expectancy for a given cryptocurrency was the most important factor for its

success. The research was conducted in Spain with college-educated adults with basic knowledge of the Internet.

Boshcov (2018) posits that banks should carefully consider the technology underlying these cryptocurrencies as a potential generic new way of transferring ownership of the value over the long term. The chapter provides an analysis of the use of cryptocurrencies in general, especially Bitcoin as the technology adoption in the presence of network externalities. The objective attitude is the future of the digital currency in the moment is still unsolved issue due to the existence of "critical mass". Further, the chapter explores financial privacy which is very sensitive issue in using digital currency (or cryptocurrency) and discuss about private choices versus political rules. The research has shown that the future of cryptocurrencies can be bright if some institutional-formal conditions are met due to the fact that success evolution of e-money requires building safety payments through three criteria—standardization, compatibility and innovation.

More and more regulators are worrying about criminals who are increasingly using cryptocurrencies for illegitimate activities like money laundering, terrorist financing and tax evasion. The problem is significant: even though the full scale of misuse of virtual currencies is unknown, its market value has been reported to exceed EUR 7 billion worldwide. This paper prepared by Policy Department A elaborates on this phenomenon from a legal perspective, focusing on the use of cryptocurrencies for financial crime, money laundering and tax evasion. It contains policy recommendations for future EU standards (Houben & Snyders, 2018).

Marella (2020) in his research on understanding the creation of trust in cryptocurrency affirms that Contemporary cryptocurrencies lack legal, monetary, and institutional backing that traditional financial services employ. Instead, cryptocurrencies provide trust through technology. Despite the plethora of research in both trust and cryptocurrencies, the underlying attributes of the technologies that drive trust in cryptocurrencies are not well understood. To uncover these attributes, we analyze the corpus of 1.97 million discussion posts related to Bitcoin, the oldest and most widely used cryptocurrency. Based on earlier research, we identified functionality, reliability, and helpfulness as the focal constructs with which to evaluate users' trust in technology. In our analysis, we discovered 11



different attributes related to three technology constructs that are significant in creating and maintaining users' trust in Bitcoin. The findings are discussed in detail in the article.

A congressional research (Perkins, 2020) suggests that the invention and proliferation of cryptocurrencies present numerous risks and related policy issues. Cryptocurrencies, because they are pseudonymous and decentralized, could facilitate money laundering and other crimes, raising the issue of whether existing regulations appropriately guard against this possibility. Many consumers may lack familiarity with cryptocurrencies and how they work and derive value. In addition, although cryptocurrency ledgers appear safe from manipulation, individuals and exchanges have been hacked or targeted in scams involving cryptocurrencies. Accordingly, critics of cryptocurrencies have raised concerns that existing laws and regulations do not adequately protect consumers dealing in cryptocurrencies. At the same time, proponents of cryptocurrencies warn against over-regulating what they argue is a technology that will yield large benefits. Finally, if cryptocurrency becomes a widely used form of money, it could affect the ability of the Federal Reserve and other central banks to implement and transmit monetary policy, leading some observers to argue that central banks should develop their own digital currencies (as opposed to a cryptocurrency); others oppose this idea.

Rahman & Khan-Dawood (2018) in a comparative study of top five digital currencies in India focused on the pros and cons of each category of cryptocurrencies and preference for one particular cryptocurrency over the other. The paper also looked at various characteristic feature of the five cryptocurrencies has highlighted that each Cryptocurrency is technically different as well as significantly different in terms of speed transaction. The study also highlighted on the risk and return of cryptocurrencies.

III. METHODOLOGY

This study adopted the narrative qualitative research approach which requires conducting in-depth interviews, reading documents, and looking for themes; in other words, how an individual story illustrates the larger life influences that created it. The reason for adopting qualitative narrative research is to meet actors on the field of blockchain and cryptocurrency in Ghana for the purpose of verifying and ascertaining. This research targets digital trading companies in Ghana.

This is because they are the actors in the field and they decide which have an in-depth knowledge on the trends and evolution of cryptocurrency and blockchain through their day-to-day transactions. There 42 equities (from 37 companies) and 2 corporate bonds currently licensed and listed as digital trading companies under the Ghana Stock Exchange. In this vein, three companies were selected conveniently in Accra Ghana to fulfil the requirements of this research.

For this study, a number of nine (9) respondents were targeted for the sample size. Those who constitute the nine are staffs of each of the companies. Three staffs were selected based on availability from each of the companies. The three companies are; Eccurrency4u (New Town), Cryptobitz (Madina) and Ewallet (East Legon). According to Sandelowski (1995) "a common fallacy about sampling in qualitative research is that numbers are unimportant in ensuring the adequacy of a sampling strategy" (p.179) Nevertheless, some methodologies have provided guidelines for selecting samples in qualitative studies based on the research design. The researcher collects data from sources directly related to or individuals that have had the experiences under investigation (Creswell, 1998: 54) The intent is to describe the essence of the experiences through the thoughts, opinion or experiences of a small group of people. Characteristically, the sample size should be between one and ten subjects (Creswell, 1998: 122). In-depth interviews were with practitioners who specialize in cryptocurrency trading. The in-depth interview format was one-on-one. In terms of formality and structure, each interview was flexible in its approach; meaning: An in-formal approach was adopted in the delivery; Questions were omitted or used in a different order dependent on the direction of the dialogue; Enquiries were at the discretion of the interviewer; and interviewer answered questions and make clarifications.

This study adopted the non-probability sampling technique, specifically- the convenience sampling and snowballing. Snowballing identifies cases of interest from people who know people who know what cases are information-rich, that is, and who would be a good interview participant (Patton, 2001). It is achieved by asking a participant to suggest someone else who might be willing or appropriate for the study. Collected data was analysed thematically.



IV. EXPERIMENTAL / SERVE RESULTS ANALYSIS

Opportunities of cryptocurrency and blockchain to Ghana's economy

The general response was that cryptocurrency provides both risks and opportunities. Respondents A, B, C, D, F, and G believe that the opportunities outweigh the risks while respondents E, H and I believe that the risks are more than the opportunities. Respondent E particularly noted that cryptocurrencies are highly unstable, can be used for money laundering or financing illegal activities. He noted that Bitcoin is illiquid (not easily converted to cash and has shown price volatility and that the discounted monetary value of Bitcoin is zero. Further, he notes that the currency does not have a central issuer, and that there is no financial or economic basis for its creation. Respondent H noted the ups and downs of the value of some cryptocurrencies. However, respondent A and C remarked that the unlimited possibilities for a transaction is a great benefit as each of the wallet holders can pay to everyone, anywhere and any amount. According to respondent F, no borders as payments made in this system are impossible for cancellation. Coins cannot be forged, copied or spent twice. These opportunities guarantee the integrity of the field system.

When asked what the benefits and opportunities of blockchain and cryptocurrency were, respondents A, B, D, F, G, H and I stated reduced transaction fee and zero inflation risks while respondents C and E noted the ease to use in any situation. Respondent F particularly expressed that it creates an open door for new opportunities. Respondent G noted that Cryptocurrency has unlimited possibilities for a transaction as each of the wallet holders can pay to everyone, anywhere and any amount. According to her, the transaction cannot be controlled or prevented, so you can make transfers anywhere in the world wherever a user is placed with a wallet.

Respondent D pointed out that Decentralization is another benefit of cryptocurrency. There is no central controlling authority in the network, the network is alluded to all participants, each computer crypto-valued member is a member of this system. Respondent H also stated that payments and transaction are done in various currencies when cryptocurrency is involved.

Risks cryptocurrency poses on Ghana's economy

Respondents A explained that cryptocurrency is used for criminal activities because it is not been supervised by financial institutions. According to him, cryptocurrency market has increased drastically. However, putting a stop to it has a lot of demerit for any country. Respondent B noted that as a digital technology, cryptocurrencies are subject to cybersecurity breaches, and may fall into the hands of hackers. Respondent C noted that price volatility; tied to a lack in inherent value is a major concern, but one which can be overcome by linking the cryptocurrency value directly to tangible and intangible assets. Respondent C stated it doesn't make sense as cryptocurrency is not regulated because it's not under control. It's not under the supervision of any reserve or any other financial institution. Respondent D noted that probably the biggest concerns with cryptocurrencies are the problems with scaling that are posed. Respondent E noted that cryptocurrency trading carries additional risks such as hard forks or discontinuation.

Despite admitting the innovative nature of cryptocurrency, Respondent F noted that there are no historical data and experience that allow you to assess how much you can trust it. Respondent G noted that the technological component always develops very quickly, and often even uncontrollably. Respondent H noted that Bitcoin for example does not provide any consumer protection. Respondent I noted that Investing in cryptocurrency today is a very risky undertaking. There is no guarantee of minimum profitability or, at least, break-even investments.

On how these risks can be curbed, all respondents generally believed that measures should be put in place to gauge cybersecurity. Respondent D proposed several solutions in curbing these risks, including lightning networks, sharding, and staking as options to overcome the scalability issue as other concerns with the technology are mostly logistical in nature. Respondent E noted that a good way to curb these risks is to familiarize oneself with these risks before trading.

Impact of potential acceptance of cryptocurrency and blockchain as a payment method on the Ghanaian economy

On whether cryptocurrency should be accepted as a payment system in Ghana, all respondents affirmed that they want it to be. Respondent A noted that accepting cryptocurrency as a payment method can allow new



monetary policy tools to be used. Respondents B, G and F were of the opinion that acceptance of cryptocurrency as a payment method will make the financial system safer: Allowing individuals, private sector companies, and non-bank financial institutions to settle directly in central bank money (rather than bank deposits) significantly reduce the concentration of liquidity and credit risk in payment systems. Respondents C, D and H noted that the acceptance of cryptocurrency as a payment method can encourage competition and innovation in the payment systems. Respondents E and I noted that the acceptance can help address the implications of alternative finance upon money creation and distribution: Non-banks, such as peer-to-peer lenders, are competing with banks and taking on a larger share of total lending. This has implications for money creation and distribution.

When asked the impact they think accepting cryptocurrency as a payment system will have on Ghana's economy, respondents A, D and I share the opinion that acceptance of cryptocurrency as a payment method will bring about economic impact on job markets. Respondents B, C and G stated that in countries like Ghana, where the domestic currency is constantly fluctuating, causing living conditions to plummet, cryptocurrency can be used to circumvent these situations. Respondents E, F and I share the belief that with its decentralized format, cryptocurrency is a global economy in which all users exchange currency regardless of their citizenship. In Ghana, the social need to communicate across borders will manifest itself in financial needs, and traditional financial institutions are not able to provide this as well as cryptocurrencies can. In time, entrepreneurs can assist in the opportunities to invest in, save, and send money across borders, in turn reframing economic business practices.

On how sustainable are the regulatory measures of blockchain and cryptocurrency, respondents A, G, and H were not confident in preferring sustainability of how blockchain and cryptocurrency can be regulated. Their reasons were that the supply of cryptocurrency tokens is not set by a central authority or government. Respondent H was quick to note that the Bank of Ghana has announced that the trading and use of cryptocurrency in Ghana is not yet legal because it is not recognized as a legitimate form of currency. However, other respondents believe that the regulatory measures can be sustainable. Respondent B noted that one way the regulatory measures of cryptocurrency can be sustainable is by taxing any fiat money used to cash out a virtual token. The main caveat with this is that this

would have to apply to specific tokens and a cryptocurrency owner could simply turn to another coin to cash out.

Future of cryptocurrency and blockchain

All respondents were positive about the future of cryptocurrency in Ghana. Respondent A predicted that by 2025, at least one innovative business built on blockchain technology will be worth \$10 billion. Respondent B also predicted that come 2026, the business value added by blockchain will grow to just over \$360 billion, then by 2030 grow to more than \$3.1 trillion. Respondent C noted that even though Cyber security is one of the most promising areas of projected growth for blockchain technology, an ongoing challenge for businesses of all sizes is data tampering. Blockchain technology can be used to prevent tampering, keeping data secure and allowing participants to verify a file's authenticity. Respondent D believes that blockchain technology will be transformative in the tech and IT sector in the coming years, similar to what the internet did for the world back in the 90s and early 2000s. He stated that today, part of our storage and backup software lets users notarize any digital data and put that fingerprint on the blockchain to ensure it can't be tampered with.

Respondents B, D, F and G share the opinions that cryptocurrency's future outlook is still very much in question. Respondent G for example sees proponents of limitless potential, while she believes critics see nothing but risk. She does concede that there are certain applications where cryptocurrency is a viable solution. The current cryptocurrency market is highly competitive and fragmented. Experts identified more factors that will determinate and raise the attractiveness and confidence in using cryptocurrency.

V. DISCUSSIONS

Opportunities of cryptocurrency and blockchain to Ghana's economy

From the information gathered in the research, the opportunities cryptocurrency and blockchain present outweigh the risks. Crypto-valves are relatively new and come with a learning curve. People mostly invest without proper knowledge and lose money due to ignorance. The unlimited possibilities for a transaction is a great benefit as each of the wallet holders can pay to everyone, anywhere and any amount. The transaction cannot be controlled or prevented, so transfers can be



made anywhere in the world wherever a user is placed with a wallet. There are no borders as payments made in this system are impossible for cancellation. Coins cannot be forged, copied or spent twice. These opportunities guarantee the integrity of the field system.

According to the study, reduced transaction fee and zero inflation risks are benefits of cryptocurrency and blockchain. This is because it creates open door for new opportunities. For those who are into business, cryptocurrency is an industry that promises the opportunity of gaining smarter contracts. Since transactions are faster, there is a higher chance of booking smarter deals and contracts with anybody in the industry who is also into Bitcoin.

Decentralization is another benefit of cryptocurrency. There is no central controlling authority in the network, the network is alluded to all participants, each computer crypto-valued member is a member of this system. This means that the central government has no power to dictate rules to cryptocurrency owners. Even if some part of the network goes offline, the payment system will continue to function steadily. Payments and transactions are done in various currencies when cryptocurrency is involved. As a result, Ghanaian business owners are engaged in transactions with external investors with ease.

Cryptocurrency creates employment through mining. It has already permitted many people and companies to develop and flourish, while many also rely on trading as their source of income. The economy is slowly shifting to adapt to these needs and cryptocurrencies have a great potential in satisfying them. It will only be a matter of time until these cryptocurrencies definitively find a way into the lives of the masses, shaping them for the better, with economic growth and inclusion in mind. Millions of people will now have the opportunity to invest, send money across borders, save money and start businesses owing to the amazing possibilities that cryptocurrencies bring to the growth of the Ghanaian economy.

Risks that use of cryptocurrency and blockchain poses to Ghana's economy?

According to the study, the risk cryptocurrency poses on Ghana's economy is that cryptocurrency may be used for criminal activities, because it is not being supervised by financial institutions. As a digital technology, cryptocurrency is subject to cybersecurity breaches, and may fall into the hands of hackers.

Evidence of this is seen with multiple Initial Coin Offerings (ICOs) getting breached and costing investors hundreds of millions of dollars. Price volatility, tied to a lack in inherent value is a major concern, but one which can be overcome by linking the cryptocurrency value directly to tangible and intangible assets as some new players do with diamonds or energy derivatives. Increased adoption should also increase consumer confidence and decrease this volatility.

Cryptocurrency is not regulated because it's not under control. It's not under the supervision of any reserve or any other financial institution. Probably the biggest concerns with cryptocurrencies are the problems with scaling that are posed. While the number of digital coins and adoption is increasing rapidly, it is still dwarfed by the number of transactions that payment giant, VISA, processes each day. Additionally, the speed of a transaction is another important metric that cryptocurrencies cannot compete with on the same level as players like VISA and Mastercard until the infrastructure delivering these technologies is massively scaled. Such an evolution is complex and difficult to do seamlessly. Cryptocurrency trading carries additional risks such as hard forks or discontinuation.

There are no historical data and experience that allow you to assess how much you can trust it. Bitcoin, like other cryptocurrencies, is still under development. Thus, something completely unexpected could happen to it, which invariably happens at the development stage not only with economic objects but also with experimental technologies. It is less "experimental" than other counterparts. In addition, relative to traditional assets, its level can be assessed as high because this asset is not intended for conservative investors. This is not good for the economy of any nation. The technological component always develops very quickly, and often even uncontrollably. This continues to appear almost daily - a huge number of competitors. Despite the advantage due to brand awareness and large venture capital injections, there is a real technological risk to cryptocurrencies in the form of the potential appearance of a more advanced cryptocurrency. Investors may simply not notice the moment when their virtual assets lose their real value. It's a big economical issue.

Bitcoin for example does not provide any consumer protection. A perfect transaction cannot be undone. All that remains after a failed transaction is to try to convince the recipient of funds to return them voluntarily. This is due to the fact that there is no



intermediary guarantor, as is the case with bank cards. Bitcoin transactions are similar to regular cash transactions, in which there are only 2 parties. However, the property of the irreversibility of transactions in itself has little effect on the risks of investing in Bitcoin as an asset. However, the investor must also be aware of this danger.

Investing in cryptocurrency today is a very risky undertaking. There is no guarantee of minimum profitability or, at least, break-even investments. All investors who are going to work with cryptocurrency must understand what the currency is about and have a clear plan of action for all sorts of scenarios. In addition, an inexperienced investor should invest only the amounts that he is willing to lose without serious consequences.

The study also pointed out that measures should be put in place to gauge cybersecurity. Mitigating this will require continuous upkeep of security infrastructure, but we are already seeing many players dealing with this directly, and using enhanced cybersecurity measures that go beyond those used in the traditional banking industries.

Curbing these risks include lightning networks, sharding, and staking as options to overcome the scalability issue as other concerns with the technology are mostly logistical in nature. Respondent E noted that a good way to curb these risks is that one familiarizes himself with these risks before trading. When a hard fork occurs, there may be substantial price volatility around the event, and trading may be suspended throughout if there are no reliable prices from the underlying market. Respondent I noted that to invest in blockchain technology, one should meet with blockchain companies to hire blockchain developers.

Impact potential acceptance of cryptocurrency and blockchain as a payment method poses on the Ghanaian economy

This study affirms that most respondents want cryptocurrency and blockchain as a payment method on the Ghana economy. The belief is that accepting cryptocurrency as a payment method can allow new monetary policy tools to be used. If digital cash is used to completely replace physical cash, this could allow interest rates to be lowered below the zero lower bound (although this is not a policy that would be advocated for). Alternatively, digital cash can be used as a tool to increase aggregate demand by making ‘helicopter

drops’ of newly created digital cash to all citizens, making it easier to meet the Bank of Ghana’s monetary policy target of price stability.

The findings also posit that acceptance of cryptocurrency as a payment method will make the financial system safer: Allowing individuals, private sector companies, and non-bank financial institutions to settle directly in central bank money (rather than bank deposits) significantly reduces the concentration of liquidity and credit risk in payment systems. It can encourage competition and innovation in the payment systems.

The findings also showed that the acceptance can help address the implications of alternative finance upon money creation and distribution: Non-banks, such as peer-to-peer lenders, are competing with banks and taking on a larger share of total lending. This has implications for money creation and distribution.

The findings also showed that acceptance of cryptocurrency as a payment method will bring about economic impact on Job markets. The rise of cryptocurrency has brought with it an entire industry that is dedicated to supervising cryptocurrency exchanges that take place throughout the world. While some early adopters have become rich quickly, others have developed companies that rely on trading as their source of income. The number of jobs in the Blockchain industry will not stop to increase. Software engineers have been the most directly sought after professionals for the cryptocurrency industry. And while this job market has fluctuated in the past few years, interests in these professions have not faltered. As cryptocurrency continues to be legalized outside of the western world, more investments and job creation are expected in Ghana. In countries like Ghana, where the domestic currency is constantly fluctuating, causing living conditions to plummet, cryptocurrency can be used to circumvent these situations.

Findings also showed that with its decentralized format, cryptocurrency is a global economy in which all users exchange currency regardless of their citizenship. This is particularly profound for entrepreneurs who are no longer subject to a national audience but one that is international with whom funds can be exchanged without the hassle of exchange rates and international law. In fact, there are cryptocurrency companies that assist business owners in Africa make financial transactions with European, American, and Asian companies with the intention of creating financial



coverage and financial liberation through exchanges worldwide. In Ghana, the social need to communicate across borders will manifest itself in financial needs, and traditional financial institutions are not able to provide this as well as cryptocurrencies can. In time, entrepreneurs can assist in the opportunities to invest in, save, and send money across borders, in turn reframing economic business practices.

The study also indicated that there is no confidence in many to proffer sustainability of on how blockchain and cryptocurrency can be regulated. Reasons being that the supply of cryptocurrency tokens is not set by a central authority or government. It also relates to cryptocurrencies as a medium of exchange. Transactions using the blockchain can be conducted, authenticated, and recorded in the public ledger without third party interference. China for example, has taken the most hard line stance to shut down exchanges in their native country and escort miners out of the country through land use regulations. The findings also showed that the regulatory measures can be sustainable. Respondent B noted that one way the regulatory measures of cryptocurrency can be sustainable is by taxing any fiat money used to cash out a virtual token. The main caveat with this is that this would have to apply to specific tokens and a cryptocurrency owner could simply turn to another coin to cash out.

Future of cryptocurrency and blockchain in Ghana?

Findings showed that there is a bright future for Cryptocurrency even though its outlook is still very much in question. The current cryptocurrency market is highly competitive and fragmented. Experts identified more factors that will determinate and raise the attractiveness and confidence in using cryptocurrency.

The cryptocurrencies would be cost effective to issue, available immediately, governed and regulated instantly liquid - liquidity should be instantly generated or generated on demand, secure and immutable - cannot be double spent, trusted-backed by a lender of last resort (e.g. a central bank), free from fractional reserve banking in its crypto-form, transparent with transaction finality (directly or remotely), add purpose to economic activity (commerce) and have sustainable value, have standards to enable interoperability and be legitimate - a competent authority to impose these standards.

VI. CONCLUSION AND FUTURE WORKS

The study has shown that the future of cryptocurrencies can be bright if some institutional - formal conditions are met. The benefits of using cryptocurrencies in trade facilitation, like cost reduction and others are recognized by the majority of academics. Bitcoin and other cryptocurrencies have the potential to replace traditional and new payment methods. But in order to achieve this and become the dominant force in the global payment system, they must provide a distinctive individual value, deal with and overcome a number of critical challenges, such as formal regulatory issues. It is unlikely to happen in a short period of time.

It is recommended that Ghana Government embark on an inclusive approach to the exploration of digital currency that provides sufficient opportunity for public input and policy review. Among the risks is that of criminal activity facilitated through the use of digital currency. The reputedly anonymous nature of cryptocurrency transactions is cited as an exacerbating factor to this risk, although consideration of the real-world effectiveness of this anonymity is a relatively complex topic. To understand the usage and limitations of anonymity in digital currency transactions, law enforcement agencies, financial investigation units and regulators all need to develop a clear understanding of the cryptocurrency protocol. Ghana should develop national strategies, which are built to match specific needs and priorities, but which also share some alignment in terms of broader strategic goals and means of implementation. To that end, it may be prudent to have the issue of cryptocurrency officially recognized as a component of future initiative. Also, banks should carefully consider the technology underlying these cryptocurrencies as a potential generic new way of transferring ownership of the value over the long term. On the other hand, we have seen that cryptocurrencies as a new rise in society constitute a new way of transparent and fluid flow of resources that can spur every economy. A more extensive coverage of data could provide comparison of market efficiency between regulated and unregulated exchanges, a ranking of exchange size based on volume would also be possible. Future research could include other time periods, e.g. daily and monthly Sharpe ratios, but also a larger sample size of price data. Future researchers should further investigate other aspects that this research might not be able to cover like the opinions of major stakeholders.

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