

CRYPTOCURRENCIES AND BLOCK CHAIN: CRITIQUE TO CENTRAL BANK OF
KENYA's PUBLIC NOTICE

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ABSTRACT

With the disruption of technologies such as the big data, artificial intelligence, the internet of things, robotics, cryptocurrencies and blockchains, business models in various sectors have been influenced both positively and negatively. The World Economic Forum 'prophecy' of businesses and individuals failure to embrace these technologies is slowly coming to pass. Innovation diffusion theory was used to explain why Kenyans are still wondering whether cryptocurrencies and blockchain is hype or a transformational technology that is able to create business opportunity or not. The purpose was to critique the Central Bank of Kenya's cryptocurrencies and blockchains public notice that was issued in an attempt to provide benefits and challenges of these technologies. Qualitative, secondary data was used based on narrative analysis specifically thematic analysis applied. The findings showed a trade-off between these technologies. The conclusion was that these technologies are transformational and probably will be adopted be as legal tender issued by the central banks. The contribution of this article is largely for academic purposes as well as to the Central Bank of Kenya, to spur them to research, learn and venture into ways of utilizing these technologies.

Key Words: *Cryptocurrencies, Blockchain, Distributed Ledger Technologies, Central Bank of Kenya, Universities, Financial Management*

INTRODUCTION

Cryptocurrencies and block chain technologies have been in existence since 2009 after the financial crisis of 2008 that caused a world economic downturn. Cryptocurrencies and block chain technologies are part of the disruptive technologies such as the online technology platform robotics, various social media applications, use of artificial intelligence in big data (World Bank Group, 2018). Cryptocurrencies as defined by Christidis and Devetsikiotis (2016), it is a form of unregulated digital money, usually issued and controlled by its developers, and used and accepted among the members of a specific virtual community. These cryptocurrencies are secured by cryptography, which theoretically marks them to not be easily forged or even copied (Frankenfiend & Sonnenshein, 2020). According to Berentsen, and Schär (2018, p.1), “bitcoin originated with the white paper that was published in 2008 under the pseudonym “Satoshi Nakamoto”. The white paper explained about an online trading system that would not be regulated by any intermediary even the central banks. Then, blockchain will allow the use of a distributed peer-to-peer network where each of the individual can interact and confirm payments without contacting any intermediary. As explained in Perera et al. (2020), blockchain is essentially a digital ledger that is used to replicate, share, and synchronize data spread across different geographical locations such as multiple sites, countries, or organizations.

Cryptocurrencies and block chain is merely technology evangelism – much like many others that are already used in society – and like other technologies it is as much about change management and careful attention to the economics and business models of industries and companies (World Economic Forum, 2019a). These kinds of technologies are changing the way production and commerce is organized allowing people to re-envision the financial and monetary systems (World Economic Forum, 2020). Bitcoin has gained a lot of attention and together with ethereum, which are types of cryptocurrencies that are being operated under the blockchain (Vujicic, Jagodic, & Randić, 2018; Lennart, 2020). According to World Bank Group (2018, p. 22), with the emergence of blockchain technologies “has triggered a flurry of activities in Europe and Central Asia (ECA), where people are using cryptocurrencies for cross-border transactions and as speculative investments.” Some people have accepted these technologies yet others have not accepted and said they were ‘a scam’. Bitcoin is not yet a legal tender but the fact is that the

future of cryptocurrencies and blockchain technologies is inevitable. According to Hamilton (2019), significant research and development investments in blockchain environments is on the heights and the maturation of application uses of “smart contracts” and other types of self-executing tools are being established.

Problem Statement and Purpose

On one hand, start-up companies are mining cryptocurrencies and providing blockchain services, and governments are experimenting with blockchain technologies to make their services more secure and more transparent. On the other hand, in the wake of Bitcoin success, almost twenty years ago since these technologies were ever mentioned, Kenyans are still wondering whether it is hype or a transformational technology that is able to create business opportunity or not. This is because comprehensive, global information on cryptocurrency and blockchain activities are not yet in place. Cryptocurrencies have been stolen by hackers and exchanged for legal tenders. Therefore, the Central Bank of Kenya (2015), warned that: “Bitcoin is a form of un-regulated digital currency that is not issued or guaranteed by any government or central bank”. Consequently, the purpose of this article was to critique the cryptocurrencies and blockchain public notice that was issued by the Central Bank of Kenya attempting to explain in depth benefits and challenges of these technologies.

The contribution of this article is largely for academic purposes to create awareness to University students and the millennials on the concept of cryptocurrencies and how they can benefit as well as take caution in their risk taking appetite. To the Central Bank of Kenya, the article shall spur them to research and venture into ways of utilizing these technologies based on the discussion from other parts of the world. Even to companies and organizations especially financial sector, the findings can be used to strategies on how to take advantage of these ‘disruptive technologies’, increase their acceptance and productivity. To individuals, the discussion can enable them to strategically plan for the days ahead.

The paper was structured in five sections: Section 1 carried the introduction. Section 2 the brief literature review. Sections 3 explained the methodology; section 4 showed the findings and discussion while section 5 provided the conclusion and recommendation.

LITERATURE REVIEW

The Innovation Diffusion Theory according to Maingi (2020); citing Gongera, 2013) defined diffusion as the process by which new ideas are imparted through specific channels after which individuals embrace and picks up the innovation. Diffusion is a social process that occurs among people in response to learning about an innovation such as a new evidence-based approach. In its classical formulation, diffusion involves an innovation that is communicated through certain channels over time among the members of a social system (Rogers, 2003). According to Dearing and Cox (2018), the typical dependent variable in diffusion research is time of adoption, though when complex organizations are the adopters, subsequent implementation is a more meaningful measure of change.

Further, Maingi explained how Rogers (1995), proposed the diffusion of innovations theory (DOI) to describe the approach through which innovation can be passed via different ways over certain period among different users (Sarker & Sahay, 2004). The theory asserts that an innovation is conveyed through various channels continually among individuals of the same social beliefs (Echchab & Hassanuddeen, 2013). This theory assumes that an innovation diffuses in a process whereby some people are more apt to adopt the innovation than others. As a result, Maingi (2020; citing Echchab and Hassanuddeen, 2013) noted that the theory classified the users as modernizers, early modernizers, and timely mass, late mass and stragglers. According to Dearing and Fox (2018), the benefit is that diffusion can be assessed among individuals such as members of Congress, organizations, or larger collectivities such as cities and states. In addition, innovation involves the deliberate application of information aimed at the generation of unique ideas which becomes successful in carrying out business dealings (Mitchell, 1990). As much as this theory is applicable to most of the technologies, it is highly criticized for not being appropriate for complex technologies yet it gives ideas on how to embrace innovations.

This theory gives the foundation of cryptocurrency which is a digital or virtual currency that is secured by cryptography, which shows that it is nearly impossible to counterfeit or double-spend while using the decentralized networks based on blockchain technology (Jung, 2018). A defining feature of cryptocurrencies is that they are generally not issued by any central authority, rendering them theoretically immune to government interference or manipulation.

METHODOLOGY

The methodology of this article involved qualitative analysis of secondary data. This is because the article was based on a critique which Coughian, Cronin and Ryan (2007) describe as an objective analysis of literary pieces. This is supported by Valente (2003) arguing critique is a systematic way of appraising strengths and limitations of an article so as to determine its credibility or applicability. The Central bank of Kenya was chosen because of its credibility and integrity in protecting the consumers' assets in terms of cash management and disbursements. The Financial Management and Control students were required to read the World Bank Group (2018) article that gave an in-depth understanding on cryptocurrencies and blockchain based on Europe and Central Asia. The students were required to do further research using the World Economic Forum and other peer reviewed journals on the same. The findings of the article were to be written up into a (4-5) page report. After grading, thirteen (13) articles were selected out of the class of 16 students to represent 81.3% of the students that met the requirements. Narrative inquiry was used with a specific use of the thematic analysis. According to Braun and Clarke (2006; cited in Nowell, Norris, White, and Moules, 2017) argue that thematic analysis is a qualitative research method that can be widely used across a range of epistemologies and research questions. It is a method for identifying, analyzing, organizing, describing, and reporting themes found within a data set.

FINDINGS AND DISCUSSIONS

For cryptocurrencies and blockchains to work, they need digital wallets, distributed ledgers, and miners who bring competition. The computer hardware consumes too much energy due to complexity of operations (Naware, 2016). The result of these technologies is to create digital markets without intermediaries. Some applications of these technologies have been the smart contracts, or self-executing contracts which have been utilized in making various sectors more efficient in funds management. These smart contracts that ride on blockchains can be used in making business more favourable in getting funds easily and faster as they have gotten rid of the middle men and all kinds of intermediaries. In particular, the small and medium businesses which have problems in accessing funds can use the cryptocurrencies for their trading and do not have to proof financial credibility so long as they have access to these virtual or digital platforms (World Bank Group, 2018). Further Lannert (2020) shows how these cryptocurrencies are being

utilised through the smart contracts so that businesses can borrow or lend; receive and deposit; operate and invest without the need of a central intermediary as the traditional bank's practice. The bitcoin is a virtual currency that people exchange through blockchain although it is still very controversial in the financial world. The three main challenges that shown in Table 3:1 below

Table 3:1 – Main Challenges of Cryptocurrencies

SRN	Various Issues	Description
1	Volatility	Cryptocurrencies prices tends to change and fluctuate instantly constantly based on the macroeconomics of demand and supply, change of interest rates as well as currency's rate of exchange (Thakur & Banik, 2018).
2	Issue of high power consumption	Cryptocurrencies use powerful hardware and electricity that if a hardware drive may fail due to malfunction or lack of enough power supply, then the digital wallet may also be corrupted. The result of this is for the owners of the currencies known as the miners becoming wealthy as the individual who lost the wallet does not have any power to access those currencies. NB: there is not yet recovery framework to that (Naware, 2016).
3	Regulations	Cryptocurrencies and blockchain technologies are not regulated yet. The transactions apply the peer to peer (P2P) totally independent from the central banks. There is an enormous risk when operating without regulations because transactions are not effectively controlled (World Bank Group, 2018).

Any system that has challenges, it also has benefits as explained in Table 3:2

Table 3-2: Benefits of Cryptocurrencies

SRN	Benefits	Description
1	Ease of transferability	Freedom of transferring bitcoins without intermediaries like commercial banks, or other financial institutions to charge transactions fees (Naware, 2016).
2	Public ledger	Public ledger that is being referred to as blockchain has its own check and balances that make it difficult for individuals to steal or cause fraud from each other. The public ledger has transparency in terms of transactions. Every transaction is recorded and the users are able to track every one of them (Xu, 2016).
3	Regulations	Unlike the centralized systems' case, in which the control belongs to a small group of people such as intermediaries or to an institution, in the case cryptocurrencies use of a peer-to-peer network does not have a centralized system of regulation

4	Security checks	(Pirjan, Petrosanu, Huth, & Negoita, 2013; World Bank Group, 2018). The security of transactions is created via cryptography that has given all the privileges and benefits of maintaining the wallet so that no one else can make any payment apart from the individual wallet's owner. The only caveat is that unless the passwords are stolen (Thakur & Banik, 2018).
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Critique of the CBK Public Notice

Based on the Central Bank of Kenya (2015), public notice proceeding from the cryptocurrencies they referred to as virtual currencies explained in depth on the challenges without mentioning any of the benefits. The implication was a lot of biasness against the new technologies to deter others from sharing the profits that banks makes. Until recently, the World Bank Group (2018) did a research on cryptocurrencies and expounded on the merits of these technologies which include decentralization, cryptographic security and transparency. Also, avoided on explaining on the hype that is available in dealing with cryptocurrencies. Therefore, both of these financial credible organizations have not revealed a tradeoff between these disruptive technologies. This article starts by critiquing the issued challenges and evaluating the risks involved:

Firstly, according to the CBK (2015), the risks associated with buying and selling with cryptocurrencies such as the Bitcoin is that they are “largely untraceable and anonymous making them susceptible to abuse by criminals in money laundering and financing of terrorism.”. This could be the reason that the framework of cryptocurrencies that lies on block chain was first mentioned by Haber and Stornetta (1991) took time before being implemented. Research work from Europe and Central Asia have shown some basic knowledge on the block chain application. However, from history, these continents' small scale use of these cryptocurrencies and blockchain emerges with a lot of transactions that could be attributed to their gambling transactions and illegal transactions (Houben, 2018). Nevertheless, the Central Bank of Kenya perception could be that they would lose a lot of money via fees and administrative charges that make their income. According to Iansiti and Lakhani (2017), all kinds of agreements, operations and any administrative transactions are the key things that make the financial frameworks of accessing charges, fees and income received in the economic, legal, and political systems that

govern interactions among nations, organizations, individuals, and their communities. Yet, these critical frameworks and bureaucracies have been the main stumbling block to not keeping up with the economy's online technologies. With the advent of blockchain it might help to scrutinize the external environment surrounding legal context of cryptocurrencies and provide an opportunity for research in sensitive issues such the tax evasion, financial fraud and money laundering (Houben, & Snyers, 2018). The framework for expanding the use of cryptocurrencies and blockchains, its infrastructural growth, and further development toward decentralization are unmistakable. But, there are so many technical terms being used and mathematical algorithms that are not explained. The result is to make the concept somewhat difficult and slow only to be comprehended to maintain "Lords of the job".

Secondly, CBK (2015) posed was that "cryptocurrencies are traded in exchange platforms that tend to be unregulated all over the world. Consumers may therefore lose their money without having any legal redress in the event these exchanges collapse or close business." This information is true and that is why WEF (2019b), Central Bank Digital Currency (CBDC) proposed application of distributed ledger technology (DLT), within the central banking community to help provide solutions in various financial issues such as effectiveness of receipts and payments; efficient hardware and software systems; acceptance of all kinds of finances; and all kinds of hackings - that have been a challenge for very many years. According to Lannquist (2019), when it comes to adoption of a new technology that seems to disrupt the "normal" way of doing business, different countries progress differently in terms of research, implementations and learning of lessons. For example, it has been only the Bank of France - central bank – that is already using blockchain technology to its fullest. No wonder, the World Economic Forum has recently created a Global Future Council Cryptocurrencies of two (2) Co-chairs, one (1) Council Manager and thirty (30) members to evaluate key challenges and opportunities within this space – and what it will take to achieve the key aims of cryptocurrencies (WEF, 2020). Proponents of cryptocurrencies predict a perfect society that will be having businesses, individuals and governments trading on their own with no intermediary while critics of these currencies are seeing this as hype that no way trading of financial matters can be done without a regulator. In addition, there in way of having individuals ride on these technologies without an intermediary (World Bank Group, 2018). However, this is where financial management distinguish between

investors versus speculators and risk averse individuals versus risk taking individuals. The overall benefit is that payments and receipts can be carried out anytime, without any limitations of weekends, or even in the week some of the financial institutions open at 9:00am and closes at 5:00pm. Cryptocurrencies such as Bitcoins can be transferred anytime anywhere (Naware, 2016). The main bone of contention in cryptocurrencies is in the legal context that many governments and individuals are wondering how these technologies can be standardized in a manner that they will be open to the public and a recovery software that can be made available to take care of eventualities. The key thing is for policy makers and governments to be involved in research, comprehend how these systems work before adopting a system of policy to regulate it and does not meet the needs of these technologies. Policy makers are supposed to understand the system before setting policies that will regulate it (World Bank Group, 2018)

Thirdly, the last risk according to CBK (2015) is that “there is no underlying or backing of assets and the value of virtual currencies is speculative in nature”. The end result of this is loss of funds due to their frequent changes of rates. On one hand, these cryptocurrencies are complex instruments like the derivatives - where a farmer is insured against famine. In case the rain fails during a particular season, the farmer may be required to pay a percentage of the total funds in the contract and if it rains well then that is forgone. These are what is being referred to as “self-regulating contracts”. Such contracts are self-executing and terminate themselves once the period of agreement elapses. This is what is commonly being referred to as “smart contracts”. These technologies can also be used in public procurement where tokens can be used to pay all government purchases and contractors and redeem these tokens from the government once the job is executed as it involves a lot of transparency. This can largely reduce fraud and ‘simple’ corruption that is experienced in government tenders and contracts. Blockchain technologies can also be used to manage vast information that cannot be managed by one server. These can also be used for keeping health records which can improve efficiency in the health sector (Lennart, 2020). On the other hand, cryptocurrency mining uses a lot of electricity but is booming in Iceland (Perper 2018), that can help to secure future electricity demands that will rise.

According to World Bank Group (2018, p. 22), “By 2017, the average price of one bitcoin (the first cryptocurrency) had risen from just a few cents in 2009 to \$15,000, doubling its

value in a single month. Then on December 1, 2017, the U.S. Commodity Futures Trading Commission approved trading in bitcoin futures. Although the price of a bitcoin had declined to about \$8,000 in April 2018, the value of bitcoins in circulation was about \$150 billion as of April 10, 2018.” The cryptocurrencies have been accepted since the year 2018 when World Bank Group produced a research on the same and other credible organisations such the Price Water Coopers and Deloitte have followed suit in producing global surveys on acceptance of these technologies. The trends have been rising since then (Deloitte’s 2020; PWC, 2020).

For the technologies to be transformational then it should be affecting the major sectors and information provided on the appropriateness of cryptocurrencies and blockchains. But as for now, it still remains hype until the various limitations of these technologies presented are addressed. It is however worth noting that even though the author has tried to give information around the topic, the critique cannot by any means be considered conclusive since emerging information is constantly being researched and reported. Taking into consideration there being many countries especially in the West, that have decided to explore more on these technologies and have structures in place to support innovation, it seems in the future be the only way to transact business in all the sectors. Africa is still in fear and lagging behind in this kind research and may be forced to adopt with no choice of convergence.

CONCLUSION

Cryptocurrencies and blockchain are a transformational technology that companies /organizations are very eager to explore by working together in large pools, to add novel transactions to the existing chain of transactions. There is still a lot of hype around the block chain technologies which is still an immature technology and with no materialized clear formula for success. The fact is that the Central Bank of Kenya is a reputable organization that demonstrated objectivity and care to its entire citizen by informing them that there is not yet a regulatory framework for cryptocurrencies and blockchains. However, as cited in the World Economic Forum that there is good news that Switzerland may be planning to be the first cryptocurrency and blockchain center, that may direct the rest of the world in changing the rules to fit into these emerging innovations. Hence, hope that most these cryptocurrencies might be connected to the acceptable currencies and be traded by the central banks.

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