

CRYPTOCURRENCY AND GLOBAL PRACTICES: LESSONS FOR NIGERIA

Abstract

This paper examined cryptocurrency and its global practices with particular reference to salient lessons for the Nigerian economy. The desk review methodology anchored on content analysis was used for the study. The paper identified distrust in political systems, weak domestic currency and high inflation rates as key factors fueling the growth of cryptocurrency usage in Nigeria thus motivating individuals to resort to cryptocurrencies as a tool for wealth preservation and inflation hedge. The study also found that the existence of trust deficit and challenges associated with privacy concerns, system uptime and stringent onboarding requirements were capable of derailing the success of the newly digital currency ('e-naira') issued by government to curtail cryptocurrency usage in Nigeria. The study concluded that cryptocurrencies and central bank issued digital currencies (CBDCs) are now part and parcel of the new economic order and represents the future of finance. It therefore recommended that nation states should work assiduously to develop uniformly agreed regulatory framework and global standards for the usage of cryptocurrencies.

Keywords: Cryptocurrency, Price Volatility, Global Practices, Central Bank Digital Currency, Nigeria

1.0 INTRODUCTION

Globally, finance and money are constantly going through transformation. Digital assets and advanced financial platforms which are controlled by sophisticated systems are now facilitating new patterns for financial transaction and building unconventional capital channels. Across the globe utilization of financial technologies is drastically transforming the ways of rendering financial services and in particular the system of payment (Genberg, 2020). This transformation is especially more pronounced in developed economies (Marr, 2017). One of the major disruptions in the financial asset exchange mechanism globally is the invention of cryptocurrency. Other areas of digital disruption include the creation and rise of neo(cloud/challenger) banks, Fintech and platform-based competitors (Vives, 2019; OECD, 2020). The transfer of asset value via digital platform among different parties without engaging third party institutions across the world is now made possible by leveraging cryptocurrencies (Hacker & Thomale 2017; Adhami & Guegan 2020). According to Raiborn & Sivitanides (2015), given that some values are attached to cryptocurrencies, they can be considered as broader class of financial assets for the individuals that have them in their possession.

Cryptocurrency as a global phenomenon has continued to engage the attention of a broad spectrum of stakeholders including but not limited to monetary authorities, national governments, development enthusiasts, alternative finance practitioners, scholars and investors. However, despite the increased attention there is a wide divergence of opinion as to its

acceptable usage and its proper place in global economics. Cryptocurrencies are digital financial assets or currencies that owe their functionality to the use of blockchain technology which has as its core the notions of encryption involving use of digital tokens, decentralized networks and peer-to-peer exchanges (Agbo & Nwadiolor 2020). Cryptocurrency, as a form of non-sovereign money, is built with the use of cryptography, and equally serves as an alternate to fiat currency as a mode of payment. In terms of origin, Bitcoin is reputed to be the pioneer cryptocurrency created by Satoshi Nakamoto in 2008 (Richter et al 2015). As a currency type, cryptocurrency represents a key form of digital currency that is particularly difficult to counterfeit (Rose 2015). Digital currencies themselves are an innovative route in the advancement of contemporary financial systems.

By design, cryptocurrencies are monetary instruments expected to have global reach, negligible transactions costs and capable of facilitating seamless cross border movement of funds (Hileman and Rauchs 2017). The process of issuing any type of cryptocurrency worldwide is done without a central administering authority. These currencies are usually generated by miners who receive income for providing computational power to the network, which helps to maintain an associated blockchain. The blockchain technology, is popularly referred to as e-wallet where cryptocurrencies are stored (Voigt, 2021). Voigt (2021) further described the blockchain technology as a public decentralized distributed ledger of all transactions using a peer to peer arrangement in such a way that it precludes the involvement of banks, government, or other third-party intermediaries. Beyond this, its potential applications further include funds transfer, settling trades, voting, automation and healthcare. Companies in digitalized economies have adopted blockchain-enabled software for the purpose of improving efficiency of payments, execution of contracts, regulatory compliance, and the management of supply chain.

As monetary instruments, there is an unsettled debate as to whether cryptocurrencies simultaneously fulfil the traditional roles of serving as store of value, unit of account and medium of exchange (Ammous 2016, Baur & Dimpfl 2021). Liu & Tsyvinsk (2018) in particular, posit that when benchmarked with either regular fiat currencies or precious metals, cryptocurrencies such as Bitcoin and Ethereum exhibit statistically insignificant attributes of traditional monies. Thus, the risk-return trade off patterns of cryptocurrencies are at variance with traditional monetary instruments. Furthermore, there have been series of concerns bordering on increased carbon footprint in an era of heightened climate change challenge (Voigt 2021, Adedolapo 2021), susceptibility to cyber-attacks, volatility and market manipulations (Apostolaki et 2017, Saad et al 2019), vulnerabilities to money laundering schemes (Campbell-Verduyn 2017, Rodrigo et al 2021). Notwithstanding aforementioned challenges, a number of nation states (including China, Canada, Singapore and Germany) have commenced active discussions as to the possible adoption of digital currencies within their financial payments systems (Chu and Koepl 2017). As at May 2021, available statistics indicate that there are nearly 10,000 tradeable cryptocurrencies globally with market capitalization in excess of \$2 trillion (Cunha et al 2021). Existing market dynamics suggests that this uptick is likely to further increase in the near future.

According to the Bank of International Settlement (2015), this drive for the adoption by developed economies has been driven largely by the desire to facilitate new economic interactions and linkages while also embracing innovation in retail payments without sacrificing the important attribute of safety, efficiency and public confidence in the digital currency. However, for emerging economies in Africa such as Nigeria, the increased appetite for cryptocurrency usage as a subset of digital currencies has been attributed to a mix of factors including rapid inflation resulting in deterioration in values of national fiat currencies, desire to boycott the cumbersome remittance and payment infrastructure of traditional banks as well as their associated high transaction costs (Preiss 2017). The flows resulting from cryptocurrency trading volumes in Nigeria have been so significant that the monetary authorities have now issued its own version of digital currency (tagged the 'e-naira') which is operating under the ambit of a centralized technology. For example, Nigeria has been identified as the largest bitcoin market in Africa as well as the third highest market with an astronomical growth in the adoption of bitcoin in recent years (Ajifowoke, 2020). Specifically, between 2015 and 2020, volume of crypto trade consummated exceeded \$566m (Uwagbale, 2020). We note however that there is little empirical evidence to support the propriety or otherwise of this move by the Nigerian monetary authorities. Furthermore, there is inconclusive evidence as to the ability of national governments to effectively institute barriers as to the use, deployment, trade and transmission of virtual currencies on cross border basis (Casino et al 2019). Consequently, the aim of this paper is to explore existing global practices with respect to cryptocurrency and digital currency usage with a view to eliciting possible lessons that will aid policy making by Nigerian authorities.

Accordingly, therefore, the central hypothesis of the work is as follows:

H_0 : The use and deployment of cryptocurrency has no significant lesson for Nigeria

The rest of the paper is arranged as follows: the next section shows an examination of extant literature from the standpoint of conceptual development, theoretical framework, and empirical reviews of related works. The third and fourth section consider the methodology adopted, results, and discussion of the research findings while the conclusion and recommendations emanating from the study are presented in section 5.

2.0 REVIEW OF RELATED LITERATURE

Digital Currencies, Virtual Currencies and Convertible Currencies

Digital currencies (DC) are essentially part of the recent innovative route in the advancement of contemporary financial systems. They are electronic alternatives to fiat(paper) currencies which permit borderless transactions and lack physical existence. Gans and Halaburda, (2015) document that they can be broadly categorized into two: privately issued DCs and Central Bank issued DCs (CBDCs). Nakamoto offered the first private digital currency known as Bitcoin which was initiated in 2008 and began operational in 2009 by Satoshi Nakamoto (Didenko & Buckley, 2018; Bissessar, 2016). Since then, many others have emerged, and the acceptance has kept growing locally and internationally. The growth and large acceptance of cryptocurrencies are attributed to the success stories of those who made a huge amount of money within a short and long period on their investment. The success of cryptocurrencies is seen in its decentralized

nature, which means that anyone can participate (trade) from any country without exclusion. Usage has been seen to affect quality of life at individual levels as well as contributing to efficiency at corporate levels (Otoo and Nemati, 2017; Zambalaeva and Yang, 2020). Central banks (apex banks) and governments worldwide are busy monitoring the advancement of digital currencies and their challenges (Said, 2019).

Virtual currencies (VC) stem from the idea of the absence of physicality which promotes ease and anonymity in the consummation of financial transactions. They exhibit similar attributes with digital currencies due to their unregulated nature and are sometimes used interchangeably (Kubat 2015; Diprova, 2016). However, this view has been further modified by the European Central Bank given that some level of regulation of the payment instrument now exist in some jurisdictions. Consequently, it is now viewed as a “digital representation of value, not issued by a central bank, credit institution or e-money institution” (ECB, 2015). According to Shukla, (2019), the United States regulators view virtual currencies from the standpoint of three dimensions: centralized convertible virtual currencies (which possesses a central repository); decentralized convertible virtual currencies (distinguished by the absence of a central repository and e-currencies brokers. Cryptocurrencies, which is the primary focus of this study falls under the category of decentralized convertible virtual currencies since they are issued and traded without the backing of any monetary authority (Bohme et al, 2015; Kayal and Rohilla, 2021). The relative instability of domestic currencies and declining trust of the banking public has provided platform for the growth in virtual currencies (Richter, et al 2015). Bolt and Van Oordt (2019) opine that valuation of VCs unlike traditional money is determined by reference to investor expectations and trade-offs with exchange rate risks.

Convertible currencies are currencies commonly used to consummate international trade transactions (Ogbeide and Naimo, 2018). They are currencies capable of either being exchanged for one another or anchored at a fixed/flexible rate or with reference to a certain pre-agreed benchmark such as gold. The West African Monetary Institute (WAMI) views them as payment instruments that is ‘freely offered and accepted for transactions across national boundaries’ (WAMI, 2008). A key element in currency convertibility is the elimination of foreign exchange restrictions and/or governmental interventions (Lawan et al, 2015). Unlike cryptocurrencies, convertible currencies are generally more liquid, stable and less prone to speculative attacks. Most scholars opine that the Euro, Japanese Yen, British Pound and the US Dollars are the commonest convertible currencies in use globally (Jain, 2015; Sissoko, 2017; Alia and Spiefelman, 2020). Valuation of convertible currencies is often a reflection of the interplay of market forces and the level of confidence reposed by international players in the economy of the issuing country (Ogbeide and Naimo, 2018)

Cryptocurrencies, Investments and Price Volatility

Investments in cryptocurrencies is driven largely by the financial risk tolerance levels of users, prevailing societal norms, attitudes and perceived benefits from the investment (Gazali, et al 2018). Investors in cryptocurrencies are usually young, technologically savvy individuals (Auer and Tercero-Lucas 2021) and assessment is with reference to correlation coefficients of associated cryptocurrency indices (Chen, et al 2016). In terms of investment returns ranking, different studies have arrived at different results due to the rapidly evolving nature of cryptocurrencies. For example, in the studies of Inci and Lagasse (2019), when viewed as a

single investment, Ripple outpaces other cryptocurrencies including Bitcoin and Litecoin. However, in the opinion of Le Tran and Lervik (2020), Litecoin is the most efficient while Ripples ranks as the least efficient crypto asset. This position changes when the investors desire is to hold an optimal investment portfolio of cryptocurrencies in pursuit of the portfolio diversification drive (Klein, et al 2018, Corbet, et al 2018, Brauneis and Mestel, 2019, Umar et al 2021). Saksonova and Kuzmina-Merlino (2019) on the other hand argue that optimal investment portfolio makes up has no bearing with its constituents rather that what is paramount is the liquidity of the tradeable cryptocurrencies and the associated trade-off between returns and risks. Thus, at any given point in time discernible investors should seek to regularly rebalance their portfolio with a view to enhancing overall profitability. On another front, when cryptocurrencies are included alongside traditional securities in a portfolio, studies have shown that they exhibit robustness and are potentially better portfolio diversifiers (Chuen, et al 2018).

Investment trading in cryptocurrency occurs on a global scale and across multiple secondary markets which are different to the traditional stock markets. While trade in traditional stocks are driven by fundamentals such as published financials of the corporates and their outlined future projections, trading activities in cryptocurrencies is driven by metrics which submit themselves to less objective quantification. These metrics include among others: social media news, social perceptions, convenience preference, perceived usefulness, extent of financial literacy and performance expectancy (Lin, et al 2016, Kishore and Sequeira 2016, Shahzab, et al 2018, Yilmaz and Hazar 2018). Arias-Olivia, et al (2019) however opined that performance expectation is the most critical element as it accounts for at least 68.45% of the investment decision criteria adopted by crypto investors.

Price volatility is another of the key elements attributable to cryptocurrency usage and holdings. The volatility of cryptocurrencies encourages extensive and emotional verges in market values (Pelegrín-Borondo, et al., 2015). Excessive volatility of cryptocurrencies brings into question its capabilities of fulfilling the traditional monetary roles of serving as a good store of value on a temporary basis (Saksonova and Kuzmina-Merlino 2019, Baur & Dimpfl 2021). Additionally, Yermak (2013) posits that this excessive volatility also negatively impacts its ability to serve as a unit of account or hedge instrument as it has no correlation to either fiat currencies or precious metals such as gold. This view has however been challenged by Dyhrberg (2016) and Trimborn et al (2018) who stressed that cryptocurrencies such as the lead type (Bitcoin) actually exhibit risk hedging capabilities when properly deployed. Overall, price volatilities are more commonplace in territories' and financial markets that are more developed and amenable to profit taking (Liu and Serletis 2019).

The price volatility often associated with cryptocurrency trade and investments have led to parallels being drawn with past historical financial market bubbles such as The South Sea, Mississippi and Tulia Mania bubbles (Vogel and Werner, 2015; Fry and Cheah, 2016; Hendrickson and Luther, 2017; Wei, 2018; Hayes, 2019; Taskinsoy, 2019). The key lessons from these parallels relates to the notion of investment irrationality, monetary policy shocks and the need to balance the risk/return trade-off arising from investments (Dale, 2004; Velde, 2007; Tianan and Ria, 2019)

Day (2004) however argues that these three principal historic market related bubbles involving wild swings arose strictly due to exogenous factors rather than an assumed illogicality of the underlying market instruments or performance of the market. This view is reinforced by Garber (2000) who posit that the occurrence of the bubbles is attributable to failures of certain market fundamentals rather than the outcome of wild speculation not grounded in rationality. Thus, while the cautionary lessons from the historical market bubbles are important, the danger of generalizing same to cryptocurrencies needs to be avoided.

Cryptocurrencies and Market Liquidity

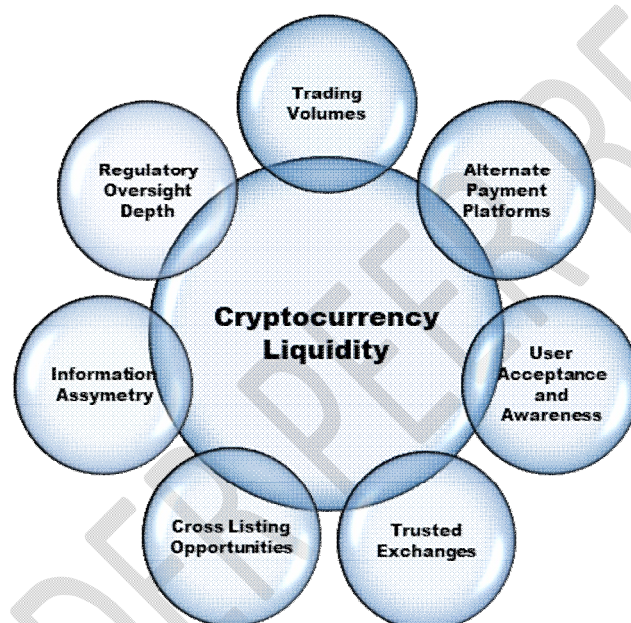
Liquidity is central to operational effectiveness of financial markets. It is also essential for all tradeable assets inclusive of cryptocurrencies. Liquidity in this case refers to the ability of an asset to be converted easily to cash on demand (Olagunju et al 2011). The speculative nature of cryptocurrencies makes it susceptible to liquidity risks and its impact have now begun to engage the attention of financial regulators globally (Daniel and Kimberly 2020). Market liquidity is the capability of participants in securities to ably conduct trading, determined by the swiftness with which huge transactions can be done and the accompanying costs of transaction (Elliott, 2015). According to Amihud et al. (2006), market liquidity depicts the existence of enthusiasm and agreement of both buyers and sellers to give an amount of securities at an agreed price with no time lag. The importance of liquidity is underscored by its effects on the earnings for investors (Elliott, 2015). According to Naik and Reddy (2021), the existence of market liquidity helps a trader to ascertain the level of his earnings and so assist in formulating suitable trading plans.

One of the most useful barometers for measurement of market liquidity of cryptocurrencies is the extent and rapidity of trading volumes (Kyriazis 2021). In terms of efficiency, other than Bitcoin, most cryptocurrencies have been generally found to be market inefficient (Le Tran and Lervik 2020, Westland 2021, Apopo and Phiri 2021). However, the levels of efficiency or inefficiency has varied with different time horizons with more recent timelines showing improving efficiency with increased usage of cryptocurrencies (Ghazzani and Jafari 2021). We note that these changing dynamics is in alignment with the adaptive market hypothesis (Lopez-Martins et al 2021). Scholars have identified the following other factors as playing significant roles in influencing the direction and depth of the liquidity of cryptocurrencies: set up of trusted exchanges, level of broad-based acceptance and awareness of would-be users, existence of alternate payment platforms such as ATMs, cards etc., and the levels of regulatory oversight available (Hougan et al 2019, Arias-Oliva et al 2019).

Using Bitcoin as a key construct for cryptocurrency, the studies of Ante (2019) found that trading volumes significantly impacted on the liquidity and market returns from cross-listings. Furthermore, when considered alongside market capitalization, they engender higher market liquidity thus encouraging holders to consider sell-offs for profit taking (Ante and Meyer 2020). Putting cryptocurrencies on new market frontiers can enhance liquidity of the underlying assets while concurrently reducing the associated cost of capital. Where cross-listings (opportunity to simultaneously list stocks at different exchanges) is possible, this provides the platform to further

provide liquidity and take advantage of price differentials in the different exchanges (Giudici et al 2019). Cross listings also have the potential to increase liquidity, increase trading volumes and enhance market value of firms (Foerster and Karolyi 2000). Howell et al (2018) assert that for cryptocurrencies, changes in market liquidity and trading volumes is positively driven by the flow of information available to crypto investors. Unlike traditional stock or foreign exchange markets, information asymmetry is very prevalent thus encouraging extensive arbitrage (Carporeale et al 2018). Brauneis et al (2020) further added that the volatility of returns and nominal quantity of transactions serve as additional elements responsible for determining market liquidity of cryptocurrencies. In their more recent work (Brauneis et al 2021) however, they opined that given the sustained volatility of this asset class, there is not yet a universally acceptable best measure to assess market liquidity of crypto assets. Figure 1 below captures a summary of the key liquidity elements of cryptocurrency.

Fig 1: Cryptocurrency Liquidity Key Elements



Source: Adapted from Foerster & Karolyi (2000), Hougan et al (2019), Arias-Oliva et al (2019)

Cryptocurrencies and Capital Controls/Regulations

Trading in cryptocurrencies is undoubtedly one of the most unregulated markets in the world. Studies have shown that the rise in unrestricted flow in capital market comes with increased financial and aggregate economic volatility (Gallagher, et al 2012). Notwithstanding, some other studies have shown that given the right policy environment, it is possible to permit cryptocurrency usage and adoption without undue negative impact on the economies of the permitting countries (Schrodt 2018, Perkins 2020, Shovkhalov and Hussein 2021) and in some cases, digital token transactions have developed into significant capital market hubs (Dewey 2019). This view is further underscored by the fact that although several monetary authorities have issued cautions about its use, they are yet to outrightly ban its usage. For example, in a

study conducted by Rico and Korwatanasakul (2019), they found that out of over one hundred and eighty (180) countries surveyed over a nine years' period (2010-2018), only twenty-two (22) countries have outrightly prohibited its use with sixty-one (61) others opting to adopt the regulation model instead. While China has outrightly banned the use of or adoption of cryptocurrency for consummation of transactions, the United States chose the regulation model in alignment with its free market philosophy and trust in its robust legal and regulatory framework (Xie 2019). Countries such as Gibraltar, Singapore, Malta, Germany, Georgia, Japan and Estonia have developed some form of regulatory framework to guide the usage and adoption of cryptocurrencies (Mikhaylov 2020).

The chief concerns of central banks globally revolve around challenges associated with unenforceability of cryptocurrency transactions in the absence of specified policy frameworks, price volatility, transaction opaqueness, poor liquidity and its vulnerabilities for the facilitation of myriads of illicit activities (Cumming et al 2016, Houben and Syners 2018). Foley et al (2019) estimates that as at 2018, over one quarter of all Bitcoin transactions valued at over \$76 billion are associated with illicit activities. This situation is made more precarious given that by its anonymous nature, there is little or no recourse available for remedies in the event of losses suffered. On the other hand, cryptocurrencies have tended to gain momentum in countries where wide ranging capital controls which are restrictive in nature exists (Carlson 2016, Higenbottam 2021). To therefore curtail this menace of circumventing established controls, it has been suggested that monetary authorities should consider putting in place mechanisms that can effectively marry regulation with the innovation that the use of cryptocurrencies bring (Butenko and Pierre 2015, Cumming 2019). This need to ensure balance between innovation and regulation has stimulated renewed desire to have in place uniformly agreed regulatory framework for the usage and adoption of cryptocurrency (Rico and Korwatanasakul 2019). Additionally, central banks may also adopt moral suasion alongside other measures such as the creation of its own digital wallet so as to foster greater financial inclusion (Broby and Baker 2018). Failure to adopt this approach in preference for strict regulation will significantly impair the liquidity of this virtual currency and hence its value. Furthermore, it has been argued that the technology driving the virtual currency has the capacity to add value to the traditional banking system in terms of fostering greater security of payment platforms (Kumar 2018), thus the need to extract value from its existence rather than consideration of a complete outlaw.

Cryptocurrencies and Global Trends

The emergence of cryptocurrencies is already significantly changing the global financial landscape with new trends taking place more frequently than originally anticipated by the pioneers of the evolving digital currency type. Global markets exposure enables economies to expand and this ultimately culminate into contraction in international capital flows. On the positive side, influxes of capital normally grow economies to the peak; while on the other hand, the downward trends of capital flows often bring about declines and financial glooms (Erten et al, 2019). According to Giudici (2019), current trends indicate that the global cryptocurrency market which was valued at about \$700bn in 2019, \$930bn in 2020 is expected to cross the \$5trillion mark by 2026 at an expected annual growth rate of 30%. This is due to the increasing

level of acceptance across various industries, products and market segments. Additionally, several scholars have documented series of key motivations stimulating the continued spread of cryptocurrency usage: distrust in traditional banking platforms, desire for freedom, double digit inflation, privacy and anonymity, technological curiosity (Maurer et al 2013, Karlstrom 2014, Vo and Xu 2017, Presthus and Malley 2017, Mikhalov 2020). Also, for practitioners of Islamic banking, cryptocurrencies are seen as being more compliant with principles of sharia banking than the use of fiat currencies (Evans 2015). Overall, the increasing spread has become more pronounced in developing economies including Sub-Saharan Africa (Alzahrani and Daim 2019). As at date, two (2) nation states have formally adopted cryptocurrency(bitcoin) as a legal tender – El Salvador and the Central African Republic. Figure 2 below shows that globally as at February 2021, about 300m active users of cryptocurrencies exists with Asia and Africa accounting for more than 63% of global usage:

Fig 2: *Global Cryptocurrency Usage*



Source: Adapted from Triple A (2021)

A cursory look at treatment of cryptocurrencies around the world revealed different approaches and treatment by the different countries involved. In China, the authorities identified that cryptocurrency had disrupted its economic order as it prevent the transmission of individual risk to the society. Therefore, in May 2013, Beijing completely shut down all operations involved in the mining of cryptocurrencies, thereafter, the central bank directed all payment firms and banks to close accounts of individuals involved in any form of cryptocurrency transactions (Xie, 2021). In 2014, the Superintendence Financiera de Colombia (SFC), a body responsible for overseeing financial systems in the South America, warned customers and also blocked financial institutions from holding and investing in bitcoin and other cryptocurrency transactions. This results from the high level of corruption associated with cryptocurrency transactions, as confirmed by the Transparency International’s 2013 Corruption Index.

In Australia, operations around cryptocurrency is free from license apart from financial instrument related activities. However, the Australian association on digital currency and commerce have regulations guiding all cryptocurrency business activities which is only compulsory for the association members (Australian Taxation Office, 2018). Canada has the second highest number of bitcoins' ATMs in the world. When cryptocurrency is used for the payments of goods and services in Canada, the transaction is taken as barter and therefore subjected to tax. Other taxes such as income and corporate or capital gains tax are charged when digital currencies are sold in Canada (Government of Canada, 2013). A number of other European countries have cautioned investors and general public on the risks connected with virtual currencies. In addition to the warnings, some have provided strict regulations to discourage dealings in virtual currencies; these countries include, France, Netherlands, Greece, Finland, Luxembourg and Belgium (Gur et al, 2017; National Bank of Belgium, 2017). In the same vein, some countries in Europe do not have specific standpoint on activities involving virtual currencies while some only have tax policies on its transactions. These countries include; Bulgaria, Ireland, Italy, Poland and Spain (Vassil, 2018; Giulio, 2018). United Kingdom has been championing the fusion of cryptocurrency in addition to creating an environment to facilitate its activities. However, the government is yet to come up with a definite regulatory and legal position on the activities bothering on cryptocurrency (Revenue & Customs, 2014).

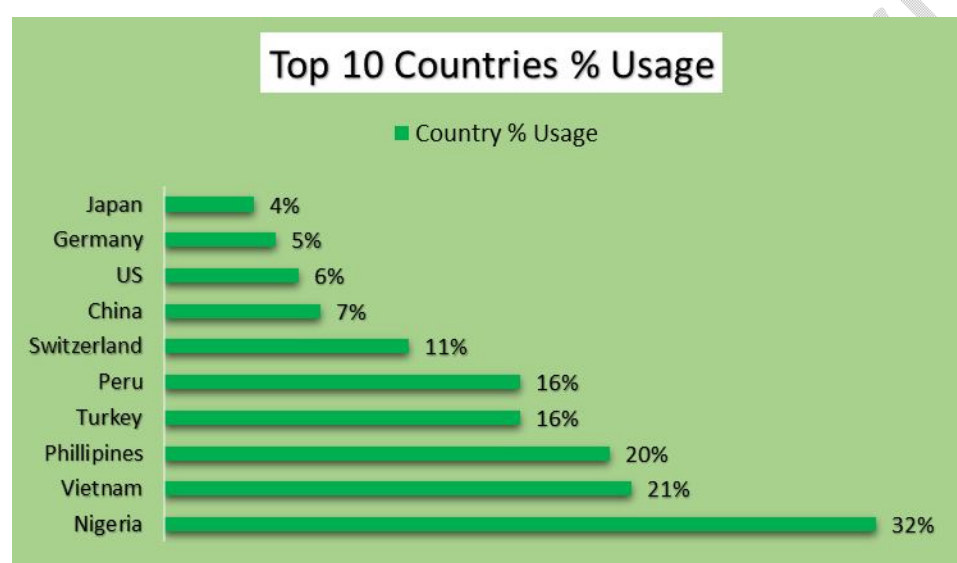
Another key global trend is the increasing preponderance for central banks around the world to issue their own autonomous digital currencies tagged 'Central Bank Digital Currency (CBDC).' Boar and Wehrli (2021) identify that about 87 central banks globally are now actively considering the issuance and adoption of a CBDC in one form or the other. These 87 banks accounts for at least 90% of the world's GDP. Bordo and Levin (2017) affirm that going this route would produce a digital currency completely stripped of the question marks hovering over cryptocurrencies especially in terms of serving as a reliable store of value and fostering price stability. Korchagrin and Yangiwa (2019) extended the discourse by identifying what it considers to be the key features of a properly developed CBDC as comprising of negotiated degree of anonymity, round the clock availability, use of modified distributed ledger technology (DLT) and increased capacity for currency storage.

Cryptocurrencies and the Nigerian Economy

Nigeria is not isolated from the current global economic reactions associated with the creation and adoption of cryptocurrency. Before now, the legal status on cryptocurrency in Nigeria was unclear compared to some African countries that have come out to explicitly prohibit trading on Bitcoins such as Algeria and Morocco (Dierksmeier & Seele, 2016). However, in response to the emerging pressures around cryptocurrency activities worldwide, the Central Bank of Nigeria (CBN) which is the apex bank in Nigeria, issued a directive to all banks in February 2021 to withdraw from cryptocurrency transactions. In addition, banks were mandated to close all accounts within their organizations which belong to corporate bodies and individuals that engage in transactions relating to cryptocurrency. CBN also cautioned investors in cryptocurrencies and reiterated that doing so is prohibited in Nigeria (CBN Update, 2021).

There have been divergent views on the impact or otherwise of cryptocurrencies on the Nigerian economy. Jimoh and Benjamin (2020) opined that the price movements in cryptocurrencies had far greater influence on Nigerian Stock Market Index than movements in the country's exchange rate. Thus, apart from traditional fiscal and monetary considerations, prudent investors need to keep an eye on the risk/return interplay of cryptocurrencies. Others have suggested that given the spiraling nature of the country's unemployment numbers worsened by youth's restiveness, opening the door to crypto trading could be a panacea for jumpstarting the economy (Adesina 2020). On the fiscal and monetary fronts, the impact of cryptocurrency on the Nigerian economy has been exacerbated due in part to the undeveloped nature of Nigeria's financial markets. Nevertheless, there has been a steady rise and uptick in cryptocurrency adoption and usage in Nigeria relative to its peers as shown in Fig 3 below.

Fig 3: Country per Country Cryptocurrency Usage



Source: Statista Global Consumer Survey (2020)

In terms of country per country analysis, according to Statista Global Consumer Survey, the top ten cryptocurrency nations globally are as depicted above with nearly one-third of Nigerians now owning or using at least one form of cryptocurrency or the other as at 2020. Following this uptick, Nigeria's monetary authorities recently announced the launch of its own digital currency tagged 'e-naira' with its operational modalities clearly aimed at fostering retail payments and facilitating financial inclusion of the unbanked. Among other features, the digital currency will be used by the government for disbursements of its various intervention schemes while also facilitating cross-border funds movements subject to pre-determined limits. As at November 2021, nearly half a million individuals have created their e-naira wallets with about \$150,000 worth of the digital currency traded (CBN Update, 2021). However, we opine that the extent of success or otherwise of the adoption of this revolutionary virtual currency will depend on the effectiveness of its administration and the abilities of the monetary authorities to forestall vulnerabilities by cybercriminals of its payment infrastructure.

Theoretical Framework

There are a number of theories that speak to the subject of technology usage, awareness and adoption and these include among others: the “theory of planned behavior (TPB), theory of reasoned behavior (TRA), the innovation diffusion theory (IDT), the unified theory of acceptance and use of technology (UTAUT) and the technology acceptance theory (TAT).” However, of the various theories, the TAT is the most widely adopted because of its sound empirical foundation, ease to use theoretical elements and general applicability to technologically induced issues (Nuryyev et al 2020). This study is therefore underpinned by the Technology Acceptance Theory (TAT) which was propounded in its original form by Davis et al (1989). The theory which is otherwise called “technology acceptance model (TAM)” is one of the greatest theories which provides insights as to the ease with which users accept and adopt technology for their individual and organizational use. TAM is one of the information systems theory, which was introduced in the doctorate proposal of Fred Davis in 1986. The theory assumes rational decision making on the part of intending and current adopters of new technologies. The theory arose as an upgrade of the theory of reasoned behavior by establishing that ease of use and assumed usefulness has the potential to impact a user’s choice pattern and ultimately actual usage of a given new technology (Fishbein and Azjen 1975). Davis et al (1989) reasoned that the crucial factor to increasing technology usage was to first enhance and measure the degree of acceptance of new financial technology product such as cryptocurrency. Thus, the theory assumes the existence of three (3) intervening principles or factors that a rational user will consider when presented with the opportunity of deciding on the choice of a new technology: “perceived usefulness (PU), perceived ease of use (PEOU), and attitude towards usage (ATU).” “Perceived usefulness” (PU) refers to the extent at which users of financial technology products such as cryptocurrency expect to experience elevated performance from such usage. The “perceived ease-of-use” (PEOU) connotes the extent users of technological products can proceed with actual usage with little or minimal tutelage. Attitude towards usage (ATU) can be described as the element that ultimately binds the first two factors together culminating in actual or future usage of technological products (Zhonggen & Xiaozhi, 2019).

Some previous studies have demonstrated the applicability of the theory for properly understanding the usage, adoption and inner workings of cryptocurrencies (Folkinshteyn and Lennon 2017, Schaupp and Festa 2018, Mendoza-Tello et al 2018). The uniform assertion of these studies were to the effect that the TAM constructs of PEOU and PU were factors which expressively impact the use cryptocurrencies for transactional purposes in different industry segments. Additionally, other studies have shown the applicability of the theory to a number of information systems and technology products: financial reporting and internet use, medical services (Portz et al, 2019), computer aided learning (Munir et al, 2021), information management (Enu-Kwesi and Opoku 2020), sports and body fitness (Drehlich et al, 2020) with relative high degree of positive outcomes. However, some scholars have criticized the theory as being of little practical importance especially when considered under the impact of social influences, ease of access, managerial beliefs and the increasing resort to e-governance (Pijpers 2001, Chutter 2009, Laugasson et al 2016, Napitupulu 2017, Torres & Gerhart 2017, Ajibade 2018). Nevertheless, the theory is considered germane for this study on the following grounds. First, the usage and adoption of cryptocurrencies is prevalent mainly among technologically savvy individuals and organizations who have an understanding of its perceived usefulness and this is in alignment with the theory. Second, as the financial landscape continue to be amenable

to the adoption of digital banking and the financial ecosystem is broadening, the advent of a disruptive financial technology such as cryptocurrencies calls for the use of a unifying theory that TAM currently represents. Thirdly, the theory has already been used successfully to predict possible response of users to new or evolving technologies in related fields such as electronic commerce, wireless internet and e-learning (Folkinshteyn and Lennon 2017). Furthermore, the functionality of cryptocurrencies rides on the acceptance or otherwise of the blockchain technology which aims to compete with current, traditional financial services. This has therefore been put forward as another basis for the choice as the theory encourages the lowering of technological entry barriers which is commonplace with cryptocurrencies.

Empirical Review

Dănilă and Robu (2019) investigated the qualification of cryptocurrency Bitcoin being rated a substitute to investment asset. The study presented literature review on value-relevance, cryptocurrency terms and speculative bubble. The results of the study confirmed that cryptocurrency Bitcoin as financial asset that can be used as another investment asset to diversify investment portfolio. The study recommended further investigation of the price of the Bitcoin cryptocurrency using time series analysis, with a view to ascertain the presence or the nonexistence of speculative bubbles. The finding is in line with the studies of Ahannaya et al (2021) which focused on determining the impact cryptocurrencies on the Nigeria Economy. The study revealed that cryptocurrencies like Bitcoin and Ethereum which popularity have been soaring worldwide alongside blockchain technology in carrying out virtual transactions has its benefits not limited to the financial sector. The study recommended that despite the related incidence of internet fraud which will pose additional challenge to the legislations, approval should be given it as valuable tool to driving economic development in this technological age.

Acho, (2021) examined the effects of legitimizing the use of cryptocurrency as a payment tool in Nigeria. Both the primary and secondary data were used with questionnaires administered to retrieve appropriate data from financial institutions and other relevant organizations. The researchers found that the use of cryptocurrency has its risks but there are also benefits accruing to its facilitating economic growth. The study concluded that, in spite of the apathy from many nations as a result of intricacies involved in its administration and control, cryptocurrency has come to stay. The researcher recommended the need for government to evaluate the regulatory frameworks for legitimizing cryptocurrency and to make sure that the relevant government agencies are hands-on in structuring relevant regulations around the new financial technology for the benefit of Nigerians.

Chukwuere (2021) undertook an appraisal of the eNaira launch in Nigeria from the perspectives of its associated opportunities and challenges using a literature review methodology. The study found that the launch provides opportunities for both regulators and the banking public in terms of transactions monitoring and transactions ease. It however recommended greater flexibility on the part of the monetary authorities to further unlock the potentials of the digital roll-out.

Esoimeme (2021) examined the impact of eNaira adoption on the drive for financial inclusion in Nigeria using a desktop approach. The paper found that if properly implemented, the eNaira

adoption has the potential of facilitating financial inclusion. However, it posits that for this to happen, efforts must be made to combat the culture of poor compliance currently prevalent in the financial system.

Enitan and Akadiri (2020) assessed the effect of cryptocurrency on selected sectors of the Nigerian economy especially the education and agricultural sectors respectively. The study found that blockchain technology which serves as the technological platform for cryptocurrency is capable of aiding access to commercial agricultural finance and consequently mitigating the challenge of food security. It however advocated for sustained education to improve knowledge and bridge the gap in cryptocurrency adoption in Nigeria.

Alo and Ishola, (2019) studied the sensitivity of Nigerians to cryptocurrency use, by their demographic features, and also ascertained the risks and prospects in the Nigerian cryptocurrency market. The researchers adopted the qualitative research method while questionnaires were administered on cryptocurrency operators within Lagos area, and used SPSS to run the analysis. Whereas, the study identified prospects with respect to data management and insurance, possible risks of cybercrime and data loss were also acknowledged. The study recommended the adoption of cryptocurrency in Nigeria as a means of facilitating exchange and economic growth.

Salawu (2018) conducted a study to determine the opinions of Professional Accountants in Nigeria about controlling cryptocurrency in Nigeria. The study employed descriptive statistics to analyze data. The results of the study showed that the Professional Accountants in Nigeria would favour government legislations for an enabling environment to use cryptocurrency. The study recommended that government legislation on cryptocurrencies take into consideration the nation's economic interest as well as the welfare of its citizenry. In conformity with this finding is the study of Cumming et al (2019) which evaluated the latent difficulties with using an older legal structure on a dynamic bionetwork. The study showed that implementation is challenging with the current regulatory structure. The study recommended for there to be cooperation between government authorities and inventors to institute a bionetwork which will incorporate investor rights and the investment.

Fauzi et al, (2020) carried out a methodical review of existing literature on the weaknesses, strengths and the prospects of cryptocurrencies and Bitcoins. The study did an overview of cryptocurrency in areas such as; existence of security token, reduced cost of transaction and adequate return on investment, enabling legislations, huge energy usage, probability of crashes and bubble, and cyber attackers. The results of the study revealed that, to develop cryptocurrency, the security protocol must be stepped up, a comprehensive study of the numerous segments of cryptocurrency to be carried out. It was recommended that the blockchain technology should be enhanced and government should put in place a regulatory framework for cryptocurrency.

Liu and Tsyynski (2018) researched on risks and returns of cryptocurrency using multiple regression analysis technique. Their findings revealed that two major market factors which are momentum and investors' attention can cause positive prediction on cryptocurrency returns.

However, while some investors' attention is negative, some that are positive can predict returns on cryptocurrency. Shahzad, Guoyi, Jian & Shahbaz (2018) using survey research design carried out an empirical study on adoption of cryptocurrencies in China especially Bitcoin. They attempted to confirm the extent to which the citizens are willing to use Bitcoin. The researchers discovered that creation of awareness and seeming credibility are major factors that inform the citizens' motive to make use of Bitcoin as a medium of exchange in China. Therefore, they recommended that government of China should regularize usage of Bitcoin while the financial institutions provide institutions create more awareness and enhance the level of trust so that the adoption rate can increase.

Alzahrani and Daim (2019) analysed the adoption decision of cryptocurrency globally using a desktop review approach. Their findings revealed that the reasons behind peoples' decision to make use of cryptocurrencies include opportunities for investment in cryptocurrencies, non-disclosure of transactions, low cost of transactions, means of payment for businesses and speed in funds transfer. Although they did not come up with specific recommendations other than asking developers of cryptocurrencies in addition to researchers and regulators to leverage the findings from their paper to understand the intention of users in relation to the adoption of cryptocurrency.

Irina (2018), evaluated the legal framework of cryptocurrency across forty-five different countries in the world using literature review approach. The researcher confirmed that many countries failed to exhibit readiness to embrace modernizations and technological development. However, the decentralized system driving cryptocurrencies will unavoidably promote unprecedented modifications in the global legal arrangement. The researcher further proposed the need to establish principle and nature of cryptocurrencies in addition to their lawful position including cash and e-money.

Janssen, et al (2015) investigated if cryptocurrency can be considered as a platform of payment that is assuring leveraging Technology Acceptance Model. This study was carried out by interviewing 13 users of cryptocurrency focusing on the impact of certain factors on the users' desire to adopt cryptocurrency. Findings from this research show that impact of ability to use feature with respect to the adoption of cryptocurrency is very low however, all the people interviewed confirmed that cryptocurrency is an assuring and prospective platform for payment. Although, given the low number of the people sampled in this study, it becomes challenging to generalize the findings.

Findings from the study conducted by Nnabuife and Jarrar (2018) confirmed that electronic media provided adverse point of view report about Bitcoin in Nigeria. The research was carried out with the use of content analysis technique to investigate how the foremost electronic media in Nigeria were reporting on Bitcoin version cryptocurrency. Umar (2017) concluded that the rise in the spread of cryptocurrencies in particular Bitcoin, has resulted from the fractional failure of the Nigerian banking industry to serve as intermediary.

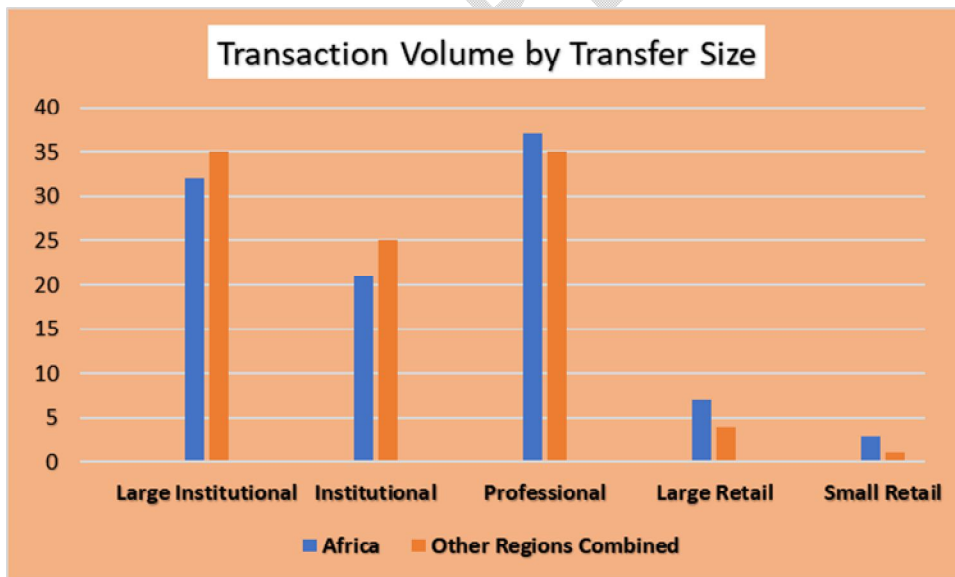
3.0 METHODOLOGY

The methodology adopted for this work was desk review research approach anchored on content analysis of previous work done. Secondary sources of data used for the work was sourced from academic references, high quality international journals, articles and from other allied websites and internet sources.

4.0 RESULT AND DISCUSSION

From the review of available literature, it is apparent that cryptocurrencies have emerged as an alternate monetary or financial asset with or without the support of regulatory authorities in diverse jurisdictions. This is particularly so for emerging countries like Nigeria where a blend of factors ranging from mutual distrust in the political system, expensive and cumbersome traditional remittance platforms, high inflation rate, high ratio of unbanked population, debilitating infrastructure deficit to weak domestic currencies have all combined to provide veritable avenue for cryptocurrency usage to thrive (Fries 2021, Whittle et al 2020). Furthermore, statistics show that efforts by regulatory authorities to ban or discourage use of cryptocurrencies for funds movement have only succeeded in pushing users from regular crypto exchanges such as Binance to peer-2-peer (P2P) payment platforms (Onyango 2021, Yiga 2021, Fries 2021). Specifically, within the last one year (July 2020 to June 2021), in terms of volume and value, cryptocurrency use in Africa grew by over 1,200% amounting to over \$105.6billion (Chain Analysis 2021). We note that this is a sharp increase from the net sum of \$8billion transacted in 2020. Figure 4 below shows that within this time period, relative to the combined performance of other regions of the world, African countries of which Nigeria is a prime player relatively outperformed others in most transaction volume metrics.

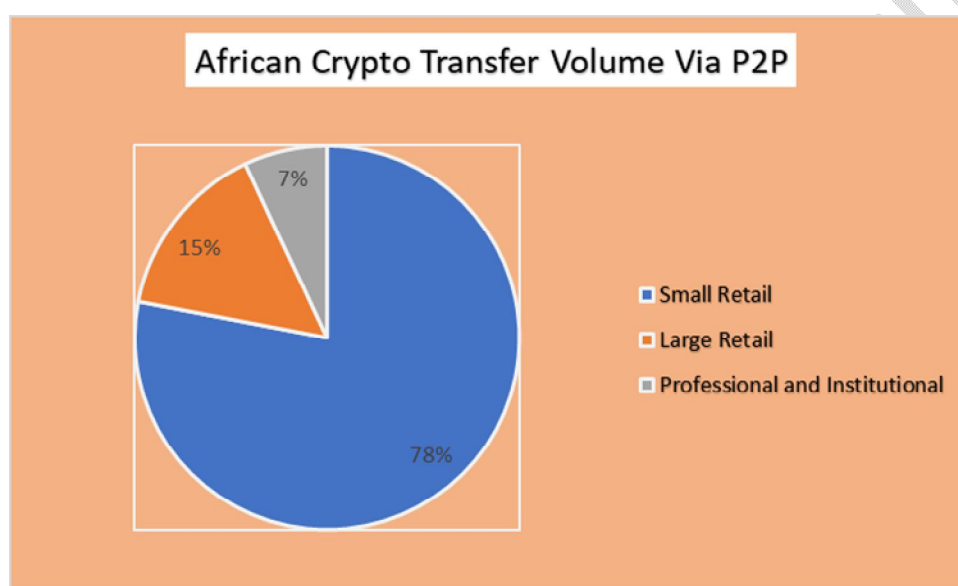
Fig 4: *Cryptocurrency Transaction Volumes - 2021*



Source: Adapted from Chain Analysis Insights (2021)

Key lessons from the above therefore is that faced with the reality of the weakening of the domestic currency (over 52% devaluation YOY), worsened by high inflation (17% as at July 2021), more Nigerians are resorting to cryptocurrency as a tool for wealth preservation and inflation hedge. Furthermore, due to restrictive capital controls involving pegging funds transfer limit in most African territories (usually \$10,000 and below), greater volumes of small ticket sized transactions have now been routed via P2P channels per time as indicated in Fig 5 below. The implication of this loss of funds flow outside official channels is that monetary and fiscal policies become less effective in monitoring economic growth and development. Consequently, unless the monetary and fiscal authorities effectively address these challenges, the trend is likely going to continue.

Fig 5: African Cryptocurrency Transaction Volumes - 2021



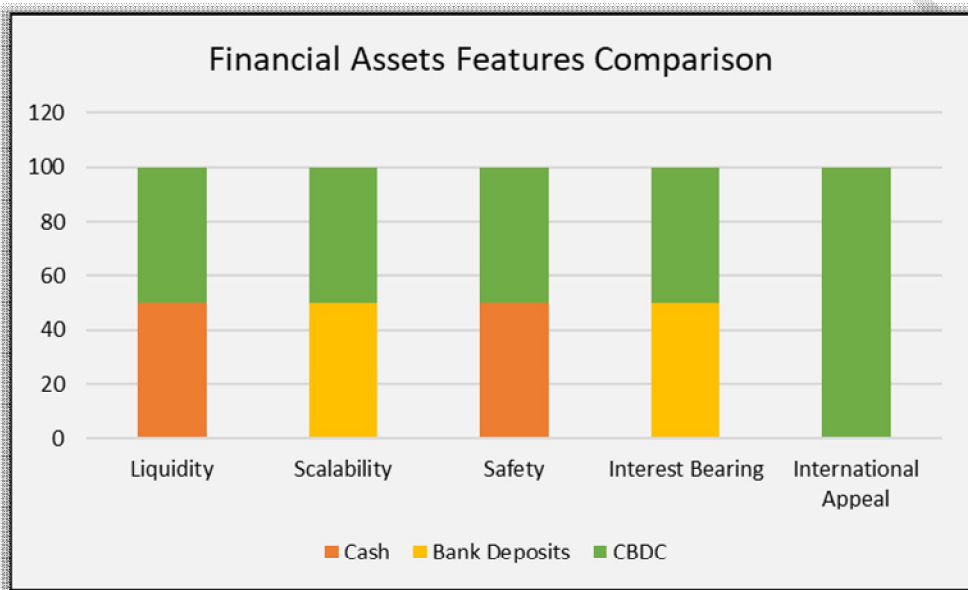
Source: Adapted from Chain Analysis Insights (2021)

To realize the full potentials of cryptocurrency in the region and see swift adoption however, there are some major challenges that are still to be overcome. Among these are inadequate internet coverage, low smart phone penetration, competition from mobile money services and hostility from national governments (Whittle et al 2020).

On another front, research suggests that the issuance and adoption of Central Bank Digital Currency (CBDC) by an emerging country like Nigeria will have a number of far reaching implications. First, where the issued CBDC is made available to non-residents in the attempt to secure global appeal, the local currency could be exposed to the risk of digital currency substitution which could weaken its value (Ferrari, et al 2021, Brunnermeier, et al 2021). The positive flip side however for the push for global appeal is the opportunity to use same as a platform to foster strategic engagements and international cooperation (Uhlig and Xie 2021). Secondly, where the issued CBDC is the interest-bearing variant, the potential to deploy the instrument as a monetary policy tool to engender domestic price stability and rate stability is

greater (Bordo, 2021). Thirdly, in an era dominated by multiple financial disruptions exemplified by the on-going challenge of issuance of digital currencies by private players such as Libra, the issuance of the CBDC represents an attempt to sustain monetary sovereignty of individual national currencies (Niepelt 2020). Additionally, with increased uptake by consumers and corporate entities, there is likely to be a shift of deposit liabilities from the position of deposit money banks to that of the monetary authorities which if not carefully managed may impair respective bank's liquidity positions. This is because as shown in Fig. 6, unlike cash and traditional bank deposits, it has the unique combined features of liquidity, scalability, safety, international appeal.

Fig 6: *Financial Assets Comparison*



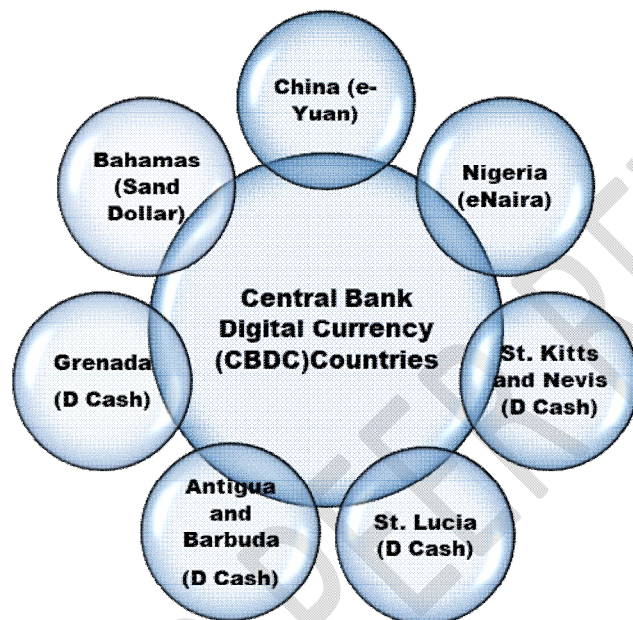
Source: Adapted from Ferrari et al (2021)

Above shows that only CBDC currently enjoys simultaneous international appeal while still exhibiting the other expected features of stable financial assets. Cash because of its associated transaction costs is not scalable while bank deposits though scalable suffers from safety and liquidity challenges especially in eras of economic uncertainties. The referenced international appeal will however only work where interoperability of systems and broad-based global operation standards have been mutually agreed on by nation states. Another direct consequence of the issuance of the CBDC is transactions costs savings and the facilitation of alternate payment avenues especially for cross-border transactions. However, the extent to which this is realizable is dependent on the perceived credibility of the issuer. This therefore poses a challenge for emerging economies such as Nigeria which is battling with series of trust deficit. Consequently, improving trust levels becomes a *sin qua non* requirement for emerging countries. Having now launched its CBDC tagged eNaira with a minted take-off value of N500m(\$1.21m), to ensure sustainable success, it is important for the Nigerian authorities to address the

challenges associated with privacy concerns, system uptime and stringent onboarding requirements.

As at October 2021, of the 87 countries that have indicated interest in developing their CBDC, only seven (7) countries have fully launched with Nigeria as the only Pan African country to do so. Sixteen (16) other countries are at various stages of pilot testing preparatory to full launch in the nearest future. Figure 7 shows details of the 7 countries that have fully issued their versions of CBDC:

Fig 7: Fully Launched CBDC Countries



Source: Adapted from Atlantic Council Research (2021)

From the above, it is apparent that apart from China, no major financial power house has launched a CBDC. In particular, we note that none of the four (4) biggest Central Banks capable of significantly influencing world economic order have launched a CBDC. According to Atlantic Council Research team, of the 4 banks (US Federal Reserve Bank, Bank of Japan, Bank of England and the European Central Bank), the US authorities appear to be least interested in a quick launch with significant progress not expected until 2026. It is our considered opinion that the absence of these leading institutions will no doubt hamper the likelihood of securing interoperability of operations and the harmonization of global policy frameworks. Although, it can be argued that this leaves room for China to take the lead in the global financial payment system (having been the only major financial player to have issued a CBDC), we opine that this influence may be muted due to the current non-scalability of the Chinese yuan. However, this may change if it succeeds in convincing other countries to latch on to its payment channels and infrastructure.

5.0 CONCLUSION AND RECOMMENDATIONS

This study set out with the primary objective of examining existing global practices with respect to cryptocurrency and digital currency usage with a view to eliciting salient lessons for the Nigerian economy. The paper identified distrust in political systems, weak domestic currency and high inflation rates as key factors fueling the growth of cryptocurrency usage in Nigeria thus motivating individuals to resort to cryptocurrencies as a tool for wealth preservation and inflation hedge. The study also found that the existence of trust deficit and challenges associated with privacy concerns, system uptime and stringent onboarding requirements were capable of derailing the success of the digital currency issued by government to curtail cryptocurrency usage in Nigeria. The study therefore concluded that cryptocurrencies and central bank issued digital currencies are now part and parcel of the new economic order and represents the future of finance.

Consequently, the study recommends as follows:

- i. That nation states should work assiduously together to develop uniformly agreed regulatory framework and global standards for the usage of cryptocurrencies. This will minimize opportunities for abuse, enhance customer protection while also strengthening individual country's monetary policy oversight abilities and hence economic planning.
- ii. That nation states rather than completely outlawing cryptocurrencies and CBDCs, they should rather seek out creative ways to optimize benefits derivable from their usage such as the blockchain technology so as to facilitate improved payment systems. Monetary authorities should be sufficiently encouraged to accept the reality that cryptocurrency can co-exist with regular fiat currencies.
- iii. To encourage citizen's uptake of its recently issued Central Bank Digital Currency (CBDC), the Nigerian authorities should consider adopting the following measures: modification of the currency to an interest-bearing variant; simplification of the current onboarding process to attract the financially excluded and improvement of system uptime to foster better customer experience.
- iv. The Nigerian authorities should also consider activating the cross-border option of the "eNaira" to facilitate inter-regional trade in line with the provisions of the African Continental Free Trade Agreement (ACFTA) while also enhancing liquidity of the currency by increasing the current ceiling of N500m (\$1.21m) to at least 1% of the nation's GDP (\$432bn as at December 2020).

COMPETING INTERESTS:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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