

# Political Economy of Digital Currency in Africa: stairway to heaven or road to nowhere?

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**Abstract:** The main purpose of the paper is to assess the nature and types of digital currency and the potential impact of digital currency adoption on African economies. The paper is based on a review of various articles, working papers, books, policy documents and legislations, and relevant websites of central banks as well as other international institutions which provide public information regarding digital currency. A qualitative descriptive design has been adopted in this study. Qualitative content analysis of documents was carried out and semi-structured interview conducted to elicit the views of five (5) key informants.

From the political economy perspective and in the light of prevailing economic conditions of chronic inflation and national currency volatility with the prospects of ‘digital dollarization, the paper argues that Africa ought to launch a single regional digital currency or a digital currency payment platform to address its negative impact rather than the issuance of national CBDCs which has the tendency to magnify the national fiat currency volatility in the digital economy. Additionally, the paper shows that digital currency average per transaction cost is 103.5 times cheaper than Sub-Saharan Africa average cost. It is also 65.5 times and 51.4 times cheaper than the digital remittance index and the global SmaRT average cost respectively. Furthermore, the paper demonstrates that digital currency adoption and spread in Africa is irreversible and Africa governments and regulators should adopt a regional approach to regulation, rather than regulate against digital assets, embrace and invest in robust research into digital currency ecosystem. Finally, in view of the limited research into digital currency adoption and its impact, design and technology options in Africa, the need for future research agenda to focus in these areas cannot be over emphasized.

**Keywords:** digital currency, political economy, financial services, regulation, Africa

## I. INTRODUCTION

Cryptocurrency remains a hotly debated concept in board rooms, among academics, as well as national and international policy makers. One area of concern is the impact of cryptocurrencies on national economies in general but more specifically on developing and transitional economies. Some scholars maintain that the emergence of cryptocurrencies in Africa will mitigate currency instability but others argue cryptocurrencies may lead to “digital dollarization” and this could adversely affect the monetary policy independency of nation states.

Digital currency adoption is gaining grounds across Africa and a little over a dozen African countries have expressed

their desire to launch Central Bank Digital Currencies (CBDCs), However, there is limited research and information on the challenges and opportunities these ‘alternative’ currencies pose for African economies and the best ways to ensure that digital currency in Africa becomes a ‘stairway to heaven rather than road to nowhere’. One study focused on the impact of national currency exchange rate instability and bitcoin adoption without paying attention to the variety of digital assets and their underlying technologies in the digital currency ecosystem (Iansiti and Lakhani, 2017). On the other hand, majority of studies are based on the impact of digital currencies on developed economies and the global financial system to the neglect of the impact of digital currency on developing economies (Bordo and Levin, 2017, Brunnermeier et al., 2019, IMF, 2020, Houben and Snyers, 2020). In view of the lack of peer review papers on digital currency in Africa, this paper aims to provide a framework that can be used to synthesize what can be learned from the general literature on meaning, nature and types of digital currency, ways governments are responding (policy and legislations) and address the question: should African nations issue CBDC in the face of chronic inflation and fiat currencies volatility?

Research design provides a roadmap of how data is collected and analysed. Research design may either be exploratory, descriptive or explanatory depending on the nature of research questions and research paradigm. Qualitative methodologies refer to tools with which researchers design their studies, collect and analyse data. The paper adopts qualitative descriptive design anchored on content analysis and thematic analysis. Primary data was obtained from articles, working papers, books, reports, policy documents and legislations, public statement and press releases by central banks, as well as relevant websites. Additionally, interviews were conducted with selected stakeholders in the digital currency space in Africa. Content analysis which included material collection and descriptive analysis was used as a data collection method while thematic analysis was used for data analysis.

## II. CONCEPTUALISATION OF DIGITAL CURRENCY: EVOLUTION AND DEFINITION

Human history abounds with challenges of exchange between one party and another. In a better economy, exchange or trade is only possible when there is “double coincidence of wants” between two parties. While the introduction of forms of money in various societies has helped to address the problem

of exchange in a barter economy, economists disagree on a clear definition of money but agree broadly that money is a matter of four functions: a medium of exchange, measure of value, standard of deferred payment and a store of value. Largely, “money” is any object that is accepted for the payment of goods and services as well as for repayment of debt. While the object has mostly been tangible, advancement in technology has led to intangibles such as electronic money being acceptable. And in an increasingly digitalized economy, cryptocurrencies have also emerged as an important financial innovation and an alternative currency which facilitates the exchange of value within a particular virtual community using a common digital platform. But what does the word “cryptocurrency” mean, is it synonymous to “virtual currency and digital currency”?

The origin of cryptocurrency remains a subject of intense debate among academics but Gautam (2015) review of existing work on cryptocurrency identified a number of papers dating back to 1967 (Harrison, 1967, 1969; Hunt and Turn, 1874, Szabo, 1997a, 1997b, 2008). For Lee and Low (2018), cryptocurrency was first introduced in the early 1990’s by an academic entrepreneur David Chaum, DigiCash’s founder with the publication of two papers (Chaum, 1983; Chaum et al, 1992). Similarly, Szabo (2008) put forward a well-developed concept of digital currency and mechanism of decentralised control for “bit gold” which is generally considered the precursor to bitcoin.

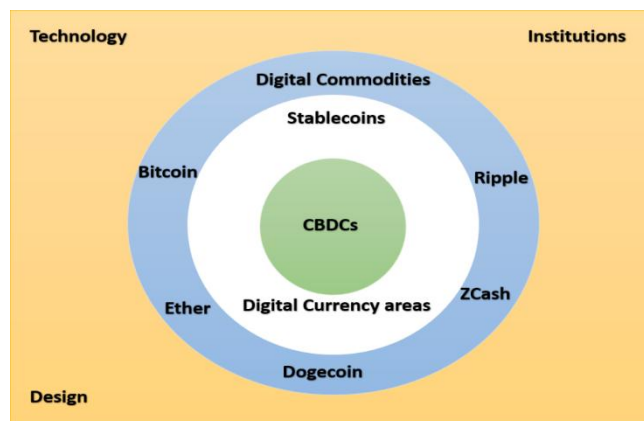
The terms; “virtual currency”, “cryptocurrency”, “digital-asset” and digital currency have been used interchangeably by some scholars and institutions including European Central Bank (2012) but others have recognized their differences (Gautam, 2015, Bank of England, 2014, Lee and Low, 2018). For instance, Lee (2015, p 6) asserts that the terms digital and virtual are used interchangeably to mean an electronic medium in which a currency is stored in a ‘digital’ or electronic register. Similarly, Guatam (2015) aver that while the term “virtual currency” is used interchangeably with ‘digital currency, digital currency appears to be used more generally to encompass virtual currency and that agencies of the United States government seem to prefer the phrase ‘virtual currency’ to digital currency. Yet again, the European Central Bank (ECB) defined virtual currency as digital money which is extracted and regulated by its developers without any officially recognised regulation while electronic money and commercial bank deposits (both legal tender) were described as regulated digital currency (ECB, 2012). However, the Bank of England (BoE) define and classify digital currency with reference to technology. Indeed, the BoE states that digital currency that uses the ‘decentralised distributed ledger as a key criterion for qualification as cryptocurrencies while those that uses distributed consensus on the ledger payment system is achieved using cryptographic techniques are referred to as “digital currencies”. In its 2014 Q3 quarterly bulletin, bitcoin was referred to as the first cryptocurrency while ripple was classified a digital currency as it uses non-cryptographic consensus method (BoE, 2014).

Since 2018, however, the terms “crypto-asset” and “digital asset” have also been introduced into legal and policy documents reflecting change of attitudes of governments toward the cryptocurrency industry. Notwithstanding its popularity and widespread usage in legal text and policy documents, the term digital currency in this paper is used in reference to cryptocurrency, crypto assets or digital assets to designate some or all types of crypto assets. Digital currency is defined as referring to “programmable coin or token created by developer (s), issued and accepted among members of a digital platform or network, run on blockchain and DLT or on similar technology (protocol), and serves as medium of exchange and unit of account” (Nantogmah et al., 2021, p.24).

### II.1 Nature and Types of “digital-assets”

Digital assets surfaced in different forms in diverse context and strict categorization is extremely difficult in a continuously changing digital currency ecosystem, but depending on its design, function, and use, a digital asset may be characterised as commodity, stablecoins or payment instrument (Figure 1). Bitcoin (BTC) is the most widely known crypto-commodity invented and launched by Satoshi Nakamoto (Fictional name) in 2009.

Figure 2: Digital assets ecosystem



Source: Nantogmah et al, 2021, p6

Crypto-commodities are characterised by high price volatility, which makes them incapable of performing the three functions of money, namely acting as a store of value, a means of payment and unit of account. Despite being considered as a ‘high-risk investment’ due to its volatile fluctuations, digital-commodities are considered to be a ‘disruptive tech’ in the field of digital currencies.

Stablecoins are digital currencies that have their market value pegged to another asset or basket of assets. Stablecoins can broadly be categorised into two main stability mechanisms ‘asset-backed’ and algorithmic. Unlike crypto-commodities, stablecoins are digital assets designed to minimise price volatility of crypto-commodities like bitcoin. Asset-backed stablecoins are sub-divided into on-chain collateral (i.e. ether, stellar) and off-chain collateral which is ‘pegged’ to fiat currencies such the US dollar, euro, yen or commodities (gold

or real estate). Asset-backed stablecoins are also referred to as single asset stablecoins which include: Tether, TrueUSD, USDC, Dai, PAX, Digix (gold) and GUSD just to mention a few. However, some asset-backed stablecoins are designed as multiple currency basket fully backed by the IMF Special Drawing Right (SDR) or algorithmic.

Crypto-assets designed as payment instruments for domestic and international payment and settlements has emerged. Some refer to these assets as multicurrency stablecoins, while others refer to them as Digital Currency Areas (DCAs). Brunnermeier et al (2019) define a digital currency area as a 'network design to facilitate digital payments and transactions using a native currency that is specific to the platform'. Payment instruments have three key features: medium of exchange, unit of account distinct from existing fiat currencies and store of value. Controlled by algorithms, DCAs are designed to ensure stability of the native coin against other assets to minimise price volatility through smart contract.

## II.2 Characteristics of digital assets

### II.2.1 Institutions

Crypto-asset or digital currency may be initiated by private or public entities, notably central banks (Chen, 2017). Two kinds of private entities are prevalent in the digital currency ecosystem. First, are platforms which use blockchain and distributed ledger technology and decentralised in their operation without legal organisation/institution that could be held accountable. Second, are centralised platforms such payment platform, digital currency areas, wallet providers, custodians, and cryptocurrency exchanges. Table 1 shows six key players in the digital currency ecosystem.

Table 1: Six key cryptocurrency Industry players and their primary function

Industry Sector	Primary function
Exchanges	Purchase, sale and trading of cryptocurrency
Wallets	Storage of cryptocurrency
Payments	Facilitating payment using cryptocurrency
Digital Currency Areas	Storage, payments and Exchanges
Mining	Proof-of-Work, Proof-of-Stake and Consensus algorithms
Central banks	Provide enabling regulatory environment for the development of digital ecosystem and CBDCs

Public institutions, predominantly central banks of various nations of the world are researching and piloting the issuance of central bank digital currencies (CBDCs). The most advanced of these initiatives is the People's Bank of China which has launch a Digital Currency Electronic Payment (DCEP) with the digital yuan as the platform's native currency. Other central banks such as the Bank of Japan,

European Central Bank, Bank of England and the Federal Reserve Bank are all at various stages of researching and conducting pilot tests of proof of concepts for the launch of the digital version of their fiat currencies.

According to Bank for International Settlement (2020), of the more than 80 percent of central banks around the world, including ten countries in Africa (Egypt, Ghana, Morocco, Kenya, Nigeria, Madagascar, Mauritius, Rwanda, Senegal-BCEAO, South Africa and Tunisia) are publicly researching payments technology and its applications, with the potential result being the launching of a CBDCs that use distributed ledger technology or non-distributed ledger technology. To date, only Tunisia has successfully launched the digital version of Tunisian dinar.

### II.2.2 Design

Digital assets are used for a variety of purposes or design rationale, including as a means of exchange, as a medium to provide access to blockchain-based goods or services, and as a way to raise funding for an entity developing activities in this area. All digital assets by design are medium of exchange-payment instruments, however, not all digital assets are good payment instruments. By design digital assets are crypto-commodities or commodity derivative with price volatility as an intrinsic design feature (bitcoin, litecoin, peercoin, ether, dogecoin etc.) and limiting supply of the assets. Other digital assets such as stablecoin are designed with an in-built price stability mechanism to bring stability to the volatile market for crypto-commodities, while payment instruments are designed to facilitate payment and settlement with an in-built convertibility from one digital asset to another and from fiat to digital assets and vice versa independent of user country. Brunnermeier et al (2019) refer to platforms such as ripple, stellar, vpayafrika, defunct libra, JPM coin saga etc. as DCAs.

With most central banks undertaking extensive work on central bank digital currencies, three main design options for CBDCs have emerged. A survey by the Bank for International Settlement (BIS) shows that central banks exploring three design rationale: wholesale, retail (Boar et al, 2020) or a combination of wholesale and retail as well as digital currency areas such as the Chinese Digital Currency Electronic Payment platform.

### II.2.3 Technology

Technology refer to the underlying network protocol underlying the creation and transfer of digital assets. Technologies adopted by developers in the digital currency ecosystem are varied and there is no generally accepted framework for the classification of digital assets according their underlying technology. However, Table 2, suggest software developers utilised varied underlying technologies, commonly referred consensus protocols which may be categorised into permissionless and permissioned, centralised and distributed ledgers. A consensus algorithm describes the rules to be followed to reach a consensus and usually

describes what operations should be performed under what conditions in detail.

Table 2: Digital currency technology: types of consensus protocols

Private blockchain	Permissioned consensus, centralised system and ledger	PBFT, Tendermint, Hotstuff, VPayAfrica, Algorand	Centralised single entity
Public blockchain	Permissionless consensus, decentralised and distributed ledger technology; Proof-of-work, Proof-of-stake	Bitcoin, Ethereum, Litecoin, dogecoin, texos, cosmos, Ethereum 2.2, Zcash	Decentralised no single entity
Federated consensus	Practical Byzantine Fault Tolerance	Ripple, stellar	Distributed yet centralised

Source: Authors Compilation

Some studies, for example, Kraemer (2018) revealed that, of the top 100 cryptocurrencies by market capitalization, only 13 percent indicated that they were pursuing alternative encrypted currency such as bitcoin. Yet again, Kraemer report that a quarter (25 out of 100) of the top 100 cryptocurrencies function as Blockchain hosting platforms for DApps; including Ethereum, Eos, Stellar, NEO, NEM, Cardana, Qtum just to name a few, while majority of cryptocurrencies function as cryptocurrency exchange platform and payment platforms ( cited in Hassani et al 2018).

### III. DIGITAL CURRENCY REGULATION: SPECTRUM OF REGULATORY APPROACHES AROUND THE WORLD

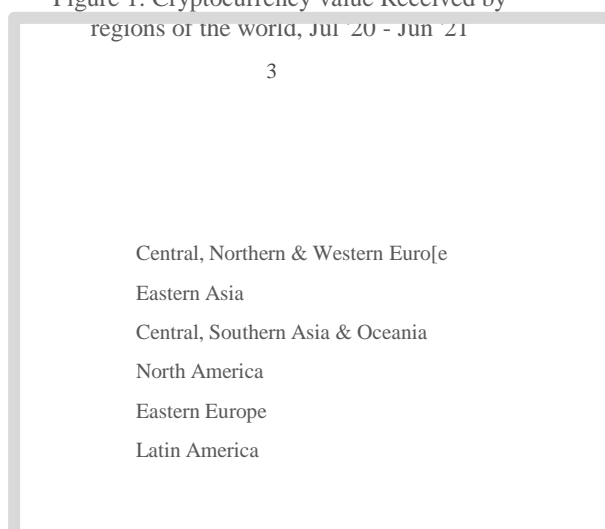
Regulation of crypto-assets has emerged as the hotly debated issue among international and national policy makers and regulators. However, there is neither comprehensive regulation nor uniformity of approaches. Broadly, response to fast-growing crypto-assets adoption has been varied. A small number of countries have embraced crypto-assets as legal tender; others while not considering it as a legal tender, allow trading in crypto-assets (permissive) through existing legislations or enactment of new laws in response crypto-assets. Furthermore, another group of countries are more cautious or restrictive to permit widespread use of crypto-assets and their approaches range from those that prohibit the use of crypto-assets to those who adopt “laissez faire” posture (Nantogmah et al., 2021). Much of existing crypto-assets regulation has been targeted at cryptocurrency exchange, Initial Coin Offers (ICOs) and custodial wallet providers. These are companies and service providers that have emerged to facilitate storing and exchanging cryptocurrencies to fiat currency or to other cryptocurrencies. In countries with permissive attitude, the consensus is that, they are part of the financial system and subject to same tax treatment, AML regulations and must comply with the same standards as any other financial service provider, like ‘know your customer’ (Demertzis and Wolf. 2018).

Digital currency regulations in Africa to date, is predominately laissez faire posture and attitude with the exception of Egypt, Algeria, and Morocco adopting a restrictive posture. Countries adopting restrictive attitude towards cryptocurrencies impose restriction in investment as well as trading and the operations of the cryptocurrency markets and barring financial institution within their borders from facilitating transaction involving cryptocurrency. Table 3 shows that majority of Sub-Saharan African countries (Ghana, Kenya, South Africa, Nigeria, Lesotho, Namibia, Mozambique, Uganda, Zambia, and Zimbabwe) are adopting a laissez faire regulatory approach to digital currency. Across these countries, digital currency is not considered a legal tender and cryptocurrency exchanges are largely unregulated and the public advised against patronizing cryptocurrency services. Central banks in these countries have imposed indirect restrictions by barring banks and other financial institutions within their borders from facilitating transactions involving cryptocurrency while issuing advisory warning to the public on the various risks associated with cryptocurrencies in order to dissuade their citizens from engaging in the cryptocurrency markets.

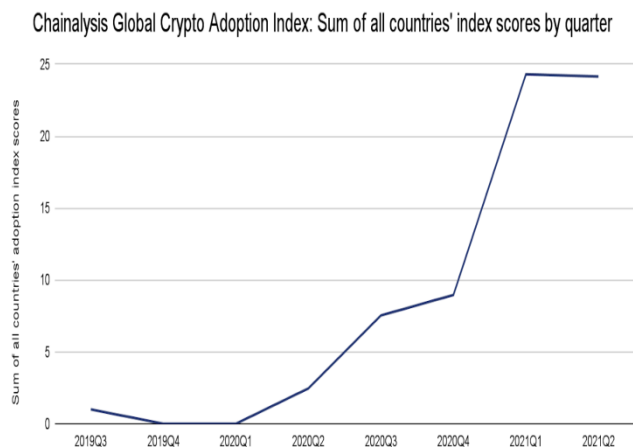
### IV. DIGITAL CURRENCY ADOPTION: GLOBAL CRYPTO ADOPTION INDEX

Since 2019, the world has witnessed exponential growth in cryptocurrency adoption across all regions. According to Chainalysis (2021), the global value received by all regions between June 2020 and July 2021 stood at \$4 trillion. From figure 1, below, Central, Northern and Western Europe received approximately \$1 trillion, accounting for quarter (25%) of global value received. Yet the African continent which is the second populous region of the world with about 1.3 billion people has the smallest cryptocurrency economy with 3% share of global value received between June 2020 and July 2021.

Figure 1: Cryptocurrency value Received by regions of the world, Jul '20 - Jun '21



From the chart below, the total Global Crypto Adoption Index score increased from 2.25 at the end Q2 2020 to 24 at the end of Q2 2021. The data across 154 countries suggest an increase in global crypto adoption by 2300% since Q3 2019. This exponential growth is attributed to more residents and countries around the world participating in the cryptocurrency economy.



Source: Chainalysis, 2021, p.8

Table 1, shows the top 20 countries according to the 2021 Global Crypto Adoption Index alongside three dimensions: on-chain value received, on-chain retail value received and P2P exchange trading volumes.

Country	Index score	Overall index ranking	Ranking for individual weighted metrics feeding into Global Crypto Adoption Index		
			On-chain value received	On-chain retail value received	P2P exchange trade volume
			Vietnam	1.00	1
India	0.37	2	2	3	72
Pakistan	0.36	3	11	12	8
Ukraine	0.29	4	6	5	40
Kenya	0.28	5	41	28	1
Nigeria	0.26	6	15	10	18
Venezuela	0.25	7	29	22	6
United States	0.22	8	3	4	109
Togo	0.19	9	47	42	2
Argentina	0.19	10	14	17	33
Colombia	0.19	11	27	23	12
Thailand	0.17	12	7	11	76
China	0.16	13	1	1	155
Brazil	0.16	14	5	7	113
Philippines	0.16	15	10	9	80
South Africa	0.14	16	18	16	42
Ghana	0.14	17	32	37	10
Russian Fed.	0.14	18	8	6	122
Tanzania	0.13	19	60	45	4
Afghanistan	0.13	20	53	38	7

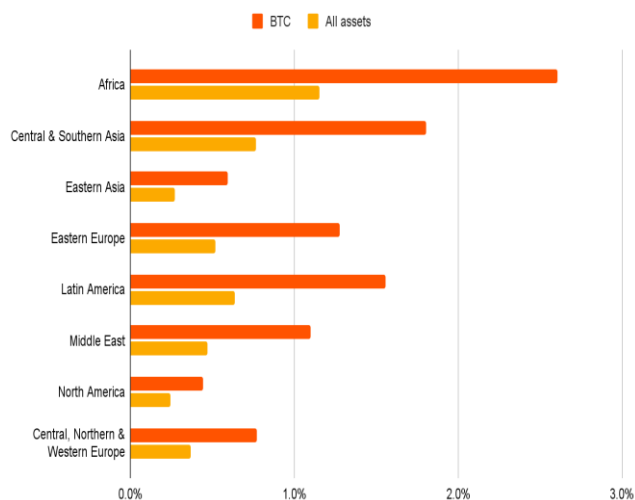
Source: Chainalysis, 2021, p.7

### V. DIGITAL CURRENCY IN AFRICA: STAIRWAY TO HEAVEN OR ROAD TO NOWHERE?

Africa has witnessed an exponential growth in mobile phone usage enabling the continent to leapfrog many advanced economies. Cryptocurrency adoption in Africa continue to keep pace with the general growth in the industry. In the 2020 Global Crypto Adoption Index, three African countries were ranked in the top 10 countries; Kenya-5; South Africa -7 and Nigeria – 8. Yet the 2021 Global Crypto Adoption Index shows 6 African countries ranked in the top 20 with three countries maintaining the continent’s three places in the top 10 with Kenya -5, Nigeria -6 and Togo, one of Africa’s three new entrance occupying ninth position. Others are South Africa -16, Ghana – 17 and Tanzania - 19.

Between June 2020 and July 2021, Africa received 3% share of total global value receives of approximately \$4 trillion which translates to \$105.6 billion worth of crypto assets. Yet Africa remains one of the fastest cryptocurrency adoption regions with market growth of over 1200% by value received over the period under review. Furthermore, the chart below suggest that the region topped peer-to-peer (P2P) payment platforms in terms of transaction volume across all regions and the third fastest growing cryptocurrency economy, Africa also has a biggest share of its overall transactions volume made up of retail-sized transfer than any other region at just over 7%, versus the global average of 5.5% (Chainanalysis, 2021),

P2P share of all transaction volume by country, July '20 - June '21



Source: Chainalysis, 2021, p.111

Africa’s cryptocurrency market is in its embryonic stage, relatively smaller compared to other regions of the world and Africa’s cryptocurrency market is expected to witness exponential growth due massive mobile phone use with five in ten global registered mobile money accounts in Sub-Saharan Africa (469 million) in 2019 and 836 million mobile phone subscribers (GSMA, 2020). Similarly, a survey of global

cryptocurrency adoption found that Nigeria is among the countries where crypto adoption is one of the highest in the world with 32% of people saying either they have used or owned cryptocurrency. (Reuters, 2020)

Digital currencies ecosystem creates new economic and financial opportunities through the development of new financial products and services. Combined with opportunities such as efficiency and innovation in the payment landscape, financial inclusion, lower transaction cost, new variety of financial assets, and act as an enabler of the digital economy; there are new and old challenges. General challenges include risk to financial stability, monetary policy stability, consumer protection and the use of digital currencies for money laundering and terrorism financing activities as well as criminal activities such illicit drug trade. More specific challenges for developing countries and Africa are: inflation and national currencies volatility, “Digital Dollarization”, regulatory inaction, and lack of investment in digital currencies technologies as well as low levels of digital skills (see Nantogmah et al., 2021).

## V.1 Challenges

### V.1.1 Inflation and economic instability

Africa like many developing countries has witnessed continuous inflation and currency volatility over the past five decades and this has resulted in the depreciation of national currencies. For example, the Ghanaian Cedi, one of the ‘best performing currencies’ on the continent depreciated more than 300% (304%) between May 7, 2010<sup>1</sup> and May 7 2020<sup>2</sup>. Similarly, the South African Rand (ZAR) also lost more than 50% of its value against the U.S. dollar in the last decade and is consistently one of the most volatile fiat currencies (Chainalysis, 2020). Furthermore, recent British Broadcasting Corporation report, suggest that the Central Bank of Nigeria devalued the currency, the naira, by 24% in 2020 and there are fears of further fall in the value by as much as 10% in 2021.<sup>3</sup>

Data from Chainalysis (2020 and 2021) in charts (1a, 1b, and 1c) in Box 1, shows the relationship between local currency exchange rate depreciation and P2P cryptocurrency trading volumes for Kenya, Nigeria and South Africa. For instance, Chart 1a shows the value of the Nigeria naira in US dollars on the left-hand axis compared to naira trading volumes on P2P platforms on the right-hand axis. The data indicates that when the naira’s value falls, P2P cryptocurrency trade volumes increase. Yet again, Charts 1b and 1c exhibits similar patterns for the South Africa rand and the Kenya shilling. As local currency exchange rate depreciates, local currencies lose, driving residents to find alternative ways to preserve the value of savings which results in increase in P2P cryptocurrency trading volumes. For Chainalysis (2021), this phenomenon reflects “user’ strategy of mitigating currency devaluation by shifting savings and possibly even

remittances and other payments to cryptocurrency assets. In all three countries, loss of value of the local currency (shilling, naira and rand) are steadily associated with increase in P2P cryptocurrency trading volumes.

Many African countries suffer from severe currency devaluation and instability which makes it difficult for citizens’ and businesses’ savings to hold their value over time; and therefore impeding on these currencies ability to perform one of the critical function of money – ‘store of value’. With high inflation and weak African local currencies, bitcoin and cryptocurrencies has become the stairway to heaven as African consumers and businesses buy cryptocurrency on P2P platform in order to preserve their savings and hedge against persistent inflation. Likewise, Saiedi et al. (2021) study found that cryptocurrency adoption and spread may be driven by inefficiencies and failing (e.g. inflation crisis) of traditional economic or financial systems.

Thus, digital currencies pose some risk to exchange rate stability across Africa. One solution proposed to address this phenomenon is the issuance of Central Bank Digital Currencies (CBDCs) by nation states. But while CBDCs may an appropriate solution for developed economies, it might make little impact on local fiat currency volatility in Africa:

*“In countries with significant inflation and instable national fiat currencies, the issuance of central bank digital currencies may not be a solution to protecting their economies from “digital dollarization”. It must be emphasized that a weak and volatile national currency, when digitalized might magnify its volatility and impact its function as store of value and medium of exchange”.*  
Nantogmah et al. (2021, p.12)

Digital dollarization refer to the intensive use by citizens of one country of digital platforms using another country’s currency as the native currency on the platform. For example, a country like the United States is home to large digital currency networks and could entrench the US dollar position as a medium of exchange for international payment. For example, in terms of market capitalization value, the 100 top cryptocurrencies by market capitalization value are United States based (UNCTAD, 2019) and 65% of all fiat currencies backed stablecoins issuers are dollar denominated. According to a recent report on the ‘State of Stablecoins; the asset-backed stablecoin (i.e. US dollars held in escrow) account for 66% of off-chain collateral (Blockchain, 2020).

### V.1.2 Inadequate crypto infrastructure and digital skills

Notwithstanding exponential growth in cryptocurrency adoption, Africa faces inadequate digital infrastructure (Information Communication Technology infrastructure) which include a platform to enable developers create and propagate digital assets, and a network to enable the transfer and tracking of digital assets. The continent’s deficiency in digital infrastructure as manifested in a recent global innovation ranking, According to Global Innovation Index (2020), 72 percent of Africa participating countries were

<sup>1</sup> May 7 2010 - 1.42 GHS = 1USD

<sup>2</sup> May 7, 2020 - 5.7500 GHS= 1USD

<sup>3</sup> <https://www.bbc.com/news/world-africa-56169917>

ranked below 100 the infrastructure metrics, representing more than two-third of all global economies ranked below 100, and no country in Africa made it into the top fifty countries in the same metrics (see Nantogmah et al., 2021).

Closely related to lack of digital infrastructure is the lack of productive, developer and entrepreneurship skills which inhibits the development of digitally enabled platform business models that creates and capture value through the delivering of industrial goods and services. For instance, the GII 2020 revealed that only Tunisia (rank 38) was in the top 50 economies under the human capacity and research metrics, six other economies (Mauritius, South Africa, Botswana, Egypt, Zimbabwe and Benin) made it in the top 100 and more than two-thirds of the 29 African economies were ranked below the top 100. Similarly, Bester et al (2020) found that in 2017, of the 104,851 Ghanaian tertiary education graduates, only 13% graduated from STEM programmes with ICT specific programmes; accounting for a meager 0.12% or less than 1000 graduates with IT-related degrees each year.

### V.1.3 Digital currency and illicit activity in Africa

The potential use of cryptocurrency for illicit activities has long been a concern for regulators and governments as well as the crypto industry stakeholders. Thus far research into the illicit use of cryptocurrency is constrained by the inherent nature of digital assets and oftentimes the lack of access to data, Africa share of value received of illicit cryptocurrency activity, including scams was estimated at 1.4 percent, representing \$5 million according Chainalysis (Chainalysis, 2020). In Africa like all other regions of the world, scams and darknet markets account for the vast majority of illicit transactions volume sent and received from Africa (ibid, p.20). Saiedi et al, (2021) study also suggest that one of the key drivers of cryptocurrency adoption around the world is the potential use of cryptocurrency for illicit activities. Yet due to the cross-border nature of cryptocurrency operations and therefore are not limited to one national jurisdiction, the need for regional or global coordinated approach to mitigate the use of cryptocurrency for money laundering and other illicit activities cannot be overemphasised.

## V.2 Opportunities

*“If managed right, digital currency technology could be a catalyst for financial innovation and regional economic integration in Africa. It could lower transaction costs, transform the payment landscape and financial services delivery. And above all, a regional digital currency area is a viable alternative to addressing challenges of ‘digital dollarization and fiat currency instability across.’”*

Nantogmah et al, (2021, p.15)

### V.2.1 Digital currency and regional integration

Regional integration and a single currency have been recurring themes in development discourse among academics and African policymakers for over half a century. Many

commentators suggest that Africa’s present socio-economic challenges is in part due to past and present African leaders confining the noble idea of regional integration to speeches, official conferences and formal treaties with limited results on the ground. The failure of Africa regional integration anchored on Regional Economic Communities (RECs) as building blocks to realise continental political and economic institution such as an African central bank with a single currency is manifested in the inability of the most advanced regional economic community, the Economic Community of West Africa States (ECOWAS) failure to launch the *Eco, a proposed single currency for the ECOWAS in July 2020* which was the fifth attempt at launching the eco in about two decades. However, with the commencement on January 1, 2021 of the African Continental Free Trade Area (AfCFTA) which brings together a potential market of about 1.3 billion people with a medium-term objective of increasing intra-Africa trade from under 20 percent to more than 30 percent by 2030. Against this backdrop, AfCFTA secretariat is facilitating the implementation of the Pan Africa Payment Platform (PAPP) (formally the Pan African Payment and Settlement System (PAPP) established in July 2019 and an interim PAPP Governing Council was inaugurated in December, 2020. Box 2 shows the main features of the PAPP.

#### Box 2: Main Features of the PAPP

- PAPP is a central financial infrastructure for the economic and financial integration of Africa.
- PAPP is a centralised payment and settlement for intra-African payments only.
- PAPP will operate independently of domestic payment system.
- PAPP payments will be in local currency and settlement will be on multilateral netting system with bilateral netting option.
- PAPP defines a common framework for transacting, clearing and settling cross-border transactions, including operating rules, business practices and standards, participating

Source: Ngozi, 2019, p.23

The process of digitalisation cannot be reversed and digital currency is irreversible, yet the proposed design of PAPP which include the use of local currencies in payment and settlement in local currency anchored on multilateral netting system with bilateral netting as an option does not address the increased transaction cost of using multiple currencies which are linked to currencies outside the zone. Again, the design of PAPP appears more to satisfy the needs of the physical economy rather than the digital economy. For example, PAPP is *designed* with Afreximbank as clearing and settlement agent with the participating central banks as co-Clearing and Settlement agents. That said, the proposed design is a ‘bank centric’ financial system which does not meet the needs of the digital economy where all activities are organized around payment platforms. In other words, the current PAPP concept belongs to the 20<sup>th</sup> century economy in a 21<sup>st</sup> century digital economy. To address these shortcomings, Africa need a rethinking of the PAPP concept and instead create digital

currency payment platform or a regional digital currency area with its own native coin (e.g. the Eco) similar to the Chinese digital currency electronic payment platform. This idea is not new but would guarantee that no change in third-country exchange rates would disturb the trading relationship among African countries themselves as Nkrumah admonished nearly six decades ago that:

*“.....While a common currency would eliminate the difficulties of exchanges as well as the illegitimate dealings which at present rob us of part of our wealth. A common currency, free of links with outside currency zones, would enable us reserve the foreign exchange made from our export trade for essential imports.” Kwame Nkrumah, 1963, p.179*

It is now evidently clear that the digital economy would be anchored on digital currency areas in US dollar, euro, and yuan, Africa risk perpetual economy exploitation with strong single regional digital currency or digital currency payment platform (DCPP) as discussed.

### V.2.2 Digital currency and the future of payment in Africa

Digital technologies are reshaping economic opportunities in Africa and around the world. In Africa, the payment industry is undergoing a digital transformation, and this transformation is accelerating with diverse channels including pay with mobile wallets and digital currency wallet, ready for a transaction to be initiated at the touch of a button. African countries have fewer legacy challenges to deal with in terms of financial infrastructure and is there adopting digitised solutions faster out of necessity and digitalisation offers a leapfrogging opportunity to transform its financial services system from bank centric to payment centric financial services system.

Payments are changing at an accelerated pace. Users expect faster, easier payments anywhere and at any time, mirroring the digitalisation and convenience of other aspects of life (Bech et al., 2017). For instance, while paper-based payments like cheques still play important roles, recent Bank of Ghana data, revealed that total value of mobile money transactions far surpassed the value of cheque transactions, by GHc389 billion in 2020. Consequently, mobile money transactions (payment centric) are challenging the traditional bank-based payment systems (Jakobsen, 2018). In the digital economy, consumers' point of contact is payment platforms, which is a sharp contrast from a bank centric financial services system where banks are the point of contact for all users of the payment system. In the real economy, payment services are offered as one key activity of banks. In many modern economics, the financial system revolves around banks at the top of financial system. However, in a digital economy, payments are at the centre and all other activities has to realign themselves around the central payment functionality (Brunnermeier et al, 2019).

### V.2.3 Digital currency and reduced transaction cost

Despite the introduction of new payment technology including but not limited to mobile money and digital payment services providers, transaction costs remain high across the world regions, and in particular Sub-Saharan Africa. Notwithstanding the general reduction remittance transaction costs in all the regions of the world since 2015, Sub-Saharan Africa which remains the most expensive region to send money to, recorded 8.02 percent total average in Q1 2021 (Figure 3). This is higher than the global average cost remittance recorded at 6.38 percent for the same period (World Bank, 2021)

Table 5: Cost of Transaction (sending) \$200 by mode of service: banks, digital services and digital currency

	Speed per transaction	Settlement per transaction	Cost per transaction	
			%	\$
Dash	1 sec	1 sec	0.005%	≤ \$0.01
Bitcoin	10 min	60 min	0.15%	\$0.30
Digital currency average cost <sup>4</sup>	5.05 sec	30.05 sec	0.0775%	\$0.155
PayPal	5 sec	8 days	3.4%	\$6.8
Credit card	3 sec	3 business days	≤ 7%	\$14.00
Banks (Wire Transfer)	1-5 days	1-5 days	10.66%	\$21.32
Digital remittance index	n/a	n/a	5.08%	\$10.16
Global average cost	n/a	n/a	6.38%	\$12.76
Global SmaRT <sup>5</sup> average cost	n/a	n/a	3.98%	\$7.96
Sub-Saharan Africa aver. cost	n/a	n/a	8.02%	\$16.04

Source: Author/s Compilation based on World Bank, 2021 and [www.bitinfocharts.com](http://www.bitinfocharts.com)

According to Remittance Prices Worldwide (2021), digital remittance remains the cheapest means of sending and disbursing funds to beneficiaries across all regions of the world. With the digital remittances index decreased from 5.11 percent in Q4 2020 to 5.08 percent in Q1 2021 as compared to traditional service providers (banks) with an average cost of 10.66 percent. However, the emergency of digital currency is expected to further drive down per transaction costs of remittance.

Digital currency (dash and bitcoin) generate greater efficiency in terms of time for transaction settlement and potential cost. Table 5 shows that compared to traditional service providers (banks) and digital remittance services, digital currency cost per transaction is the least expensive among all remittance services providers. With an average digital currency per

<sup>4</sup> Digital currency average cost is calculated as the average of least cost (dash) and the highest cost (bitcoin) of transaction per cost.

<sup>5</sup> SmaRT is calculated as the average of the three cheapest qualifying services for sending the equivalent of \$200 in each corridor and is expressed as a percentage of the total amount sent (World Bank, 2021, p.9).



transaction cost of \$0.155, compared to digital remittance index of \$10.18 and global SmART average cost of \$7.96, digital currency average cost is 65.5 times and 51.4 times cheaper than the digital remittance index cost and the global SmART average cost respectively. In addition, digital currency average cost is 82.3 times and 137.3 times cheaper than global average cost and traditional services providers (banks) respectively. Table 5 further compares Sub-Saharan Africa average cost of remittance and digital currency average cost. It shows that the digital currency average cost is 103.5 times cheaper than Sub-Saharan Africa average cost. Dash, one of the least expensive per transaction cost in the digital currency ecosystem is 1604 times cheaper than the Sub-Saharan Africa average cost as well as 1016 times and 796 times cheaper than the digital remittance index and global SmART average cost respectively.

## VI. CONCLUSIONS AND IMPLICATIONS

The emergence and spread of digital currency in Africa are irreversible regardless of the present status as the smallest crypto economy among all regions of the world. Already it has emerged that the continent may face digital dollarization and increased fiat or national CBDCs instability. To address the effects of digital dollarization on African economies, two solutions has been proposed: CBDCs and Africa regional digital currency areas with its native coin (Nantogmah et al., 2021; Coeure, 2021; Botti, 2021; BIS, 2021). Nonetheless, with more than forty (40) volatile and instable fiat currencies, economies on the continent, may face digital dollarization and increased fiat or national CBDCs instability. We argue that without an Africa regional digital currency, foreign CBDCs and stablecoins may increase pressures for currency substitution across Africa resulting in worsen local currency vulnerability and could reduce monetary and fiscal policy effectiveness.

While qualitative descriptive in nature, the paper paints a picture of the digital currency landscape in Africa and the potential challenges and opportunities posed by the nascent digital currency industry. To the best of our knowledge, this paper is the first academic empirical inquiry with African coverage of the emergency of digital currency and CBDCs as alternative financial system. A significant contribution of this paper is therefore analysing available data and literature for future studies in promising and emerging field,

### 6.1 Implications for regional digital currency area

Emergence of Digital Currency Areas. Central bank digital currencies are a reality, China has launched e-CNY and the cryptocurrency Act of 2020 suggest that the US will soon issue a digital dollar. The U.S. Federal Reserve and European Central Bank are among several central banks across the globe piloting with the idea of issuing a digital version of their currencies to keep up with technological advances that have spurred the rise of bitcoin and other private initiatives. Based on current trends, it is envisaging the emergency of network based digital currency areas and state backed digital currency

areas for the digital dollar, the e-euro, e-pound, digital Yen and e-CNY.

Under these circumstances, Africa faces an existential threat in the digital economy without a stable regional digital currency. In other words, should African countries introduce digital versions of their existing fiat currencies, they may face threats to their financial systems and monetary autonomy as a result of digital dollarization as consumers and businesses replace national weak digital currencies with stablecoins and digital commodities. That said, a single African digital currency or an Africa digital currency payment platform should not be an end but a means to sustainable regional socio-economic advancement and Africa must learn lessons from the European Monetary Union - *the creation of a single currency without creating a set of institutions that enabled a region of Europe's diversity to function effectively with a single currency* (Stiglitz, 2016).

### 6.2 Transaction cost

Digital currency will reduce transaction cost across borders and eliminate swiching costs – a traditional obstacle to currency competition and, in the process increase currency competition and redefine the international monetary system. For instance, digital currency transaction cost is 500 times cheaper than traditional remittance (banks), 290 times and 319 times cheaper than digital remittance index and global average cost of sending \$200 in Q1 2021.

### 6.3 Transition from bank centric to payment centric financial system

Yet again, African nations have lagged in traditional banking infrastructure, but the continent has achieved phenomenal success in mobile money accounts and thus, has comparative advantage in the deployment digital and mobile phone infrastructure which could enable the continent to transit fast from a bank centric financial system to a payment centric financial system.

### 6.4 Robust regulation and innovation are compatible

While digital currency regulations have taken shape in all developed economies, 75 percent of African countries have no regulatory framework for the flourishing crypto industry as countries adopt a laissez faire or restrictive postures. Recent experience in Nigeria supports the view that banning cryptocurrency will not prevent cryptocurrency adoption. For example, Nigeria was ranked 8<sup>th</sup> position in the 2020 Global Crypto Adoption Index, but after banning cryptocurrency activities in the same year, the country moved to 6<sup>th</sup> position in the 2021 Global Crypto Adoption Index. Thus far, banning cryptocurrency will constrain regulators' ability to understand digital currency ecosystem to enable the enactment of robust regulations that foster innovation. To achieve this balance, regulations in Africa must be informed by actual use cases and consultations with technology innovators will prove more robust in the long run and will reinforce important policy objectives driving economic inclusion, competition and

growth. African governments need to declare their stance on digital currency to attract investment in this nascent but promising industry.

#### ACKNOWLEDGEMENTS

An earlier Version of the paper was published in the BTU Discussion Paper Series in August, 2021. We are grateful to all who sent us comments and suggestions. The work was supported by the VPayAfrica Foundation, Accra.

#### REFERENCES

- [1] African Union(2020a) , The Digital Transformation Strategy for Africa (2020-2030) <https://au.int/en/documents/20200518/digital-transformation-strategy-africa-2020-2030>, accessed on 28/02/2021
- [2] African Union (2020b) The Extraordinary Specialized Technical Committee on Finance, Monetary Affairs, Economic Planning and Integration, 01 – 04 December 2020
- [3] Ali Robleh and Narula Neha (2019) Redesigning digital money: what can we learn from a decade of cryptocurrencies, Digital Currency Initiative, MIT Media Lab
- [4] American Bar Association (2020) Digital and Digitized Assets: Federal and State Jurisdictional Issues, [https://www.americanbar.org/content/dam/aba/administrative/business\\_law/buslaw/committees/CL620000pub/digital\\_assets.pdf](https://www.americanbar.org/content/dam/aba/administrative/business_law/buslaw/committees/CL620000pub/digital_assets.pdf) (accessed 12/04/2021)
- [5] Amstad Marlene, Huang Bihong, Morgan Peter J, and Sayuri Shirai (2019) Central Bank Digital Currency and Fintech in Asia, Asian Development Bank Institute
- [6] Bank of England (2020) Discussion Paper: Central Bank Digital Currency Opportunities, challenges and design, March 2020
- [7] Bank of England (2014) Innovations in Payments technologies and the emergency of digital currencies, Quarterly Bulletin Q3
- [8] Barontini Christian and Holden Henry (2019) Proceeding with Caution- a survey on central bank digital currency, BIS Paper No. 101, Monetary and Economic Department, <https://www.bis.org/publ/bppdf/bispap101.pdf> accessed on March 1, 2021
- [9] Betancourt Michael (2015) the critique of Digital Capitalism: An analysis of the political economy of digital culture and technology, Punctum Books, New York
- [10] Berg Andrew and Borensztein Eduardo (2000) Full Dollarization: The Pros and Cons for Full Dollarization, Economic Issues No.24, IMF
- [11] Bilotta Nicola and Botti Fabrizio (2021) “The (Near) Future of Central Bank Digital Currencies: Risks and Opportunities for the Global Economy and Society”, Peter Lang AG, International Academic Publishers, Bern, Italy
- [12] BIS G7 Working Group on Stablecoins (2019) Investigating the impact of global stablecoins. BIS report
- [13] Blockchain (2020) the state of stablecoins, <https://www.blockchain.com/ru/static/pdf/StablecoinsReportFinal.pdf>
- [14] Boar Codruta, Holden Henry and Wodsworth Amber (2020) Impending arrival – a sequel to the survey on central bank digital currency BIS Papers No 107, Monetary and Economic Department
- [15] Bordo, M and A Levin (2017), “Central Bank Digital Currency and the Future of Monetary Policy”. NBER Working Paper No. 23711
- [16] Brunnermeier K, Markus, Harold James, Jean-Pierre Lauda (2019) The Digitalization of Money, Working Paper 26300, <http://www.nber.org/papers/w26300> , accessed on 23/03/2021
- [17] Chainalysis (2020) The 2020 Geography of Cryptocurrency Report: Analysis of Geographic Trends in Cryptocurrency Adoption, Usage, and Regulation, September 2020, <https://go.chainalysis.com/2020-geography-of-crypto-report.html>
- [18] Coeure Benoit (2021) “Central bank digital currency: the future starts today”, <https://www.bis.org/speeches/sp210910.htm> (accessed September 11, 2021)
- [19] Chen, Q (2017) ‘Next stop in the cryptocurrency craze: a government-backed coin’, CNBC, 30 November 2017, <https://www.cnbc.com/2017/11/30/cryptocurrency-craze-springboards-government-backed-coin.html> (accessed: 12/03/2021)
- [20] Cornell University, INSEAD and the World Intellectual Property Organisation (2020) Global Innovation Index 2020: Who Will Finance Innovation? Ithaca, Fontainebleau, and Geneva
- [21] Denertzis, M, and Wolf, G. B. (2018) The Economic and Potential and Risk of Crypto Assets: Is a Regulatory Framework Needed?, Brussels: Bruegel, 2018); [https://www.bruegel.org/wp-content/uploads/2018/09/PC-14\\_2018.pdf](https://www.bruegel.org/wp-content/uploads/2018/09/PC-14_2018.pdf) (13/04/2021)
- [22] Eastern Caribbean Central Bank (2019) ECCB to Issue World’s First Blockchain-based Digital Currency, <https://www.eccb-centralbank.org/news/view/eccb-to-issue-worlds-first-blockchain-based-digital-currency> accessed on 01/03/2021
- [23] Gautam Vora (2015) Cryptocurrencies: Are Disruptive Financial Innovations Here? *Journal Modern Economy*, Vol. 6, no. 7
- [24] Gerbra Eddie and Rubio Margarita (2019) Virtual Money: How Much do Cryptocurrencies Alter the Fundamental Functions of Money?, Monetary Dialogue Papers, December, [Virtual Money: How Much do Cryptocurrencies Alter the Fundamental Functions of Money?](https://www.ecb.europa.eu/press/pr/20191204/virtual-money/) (europa.eu)
- [25] Hanna Halaburda and Miklos Sarvary (2016) Platform-Based Currencies. In *Beyond Bitcoin*, Palgrave Macmillan, New York
- [26] Hossein Hassani, Xu Huang and Emmanuel Sirimal Silva (2019) Fusing Big Data, Blockchain and Cryptocurrency: Their Individual and Combined Importance in the Digital Economy; Palgrave Macmillan, Cham, Switzerland
- [27] Houben, Robby and Snyers, Alexander (2020) Crypto-assets: Key developments, regulatory concerns and responses, Policy Department for Economic, Scientific and Quality of Life Policies, [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/648779/IPOL\\_STU\(2020\)648779\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/648779/IPOL_STU(2020)648779_EN.pdf)
- [28] International Monetary Fund (2020) Digital Money Across Borders-Macro-Financial Implications, September 22, 2020
- [29] Lakhani Karim R (2017) The Truth about Blockchain: It will take years to Transform business, but the Journey Begins now, Harvard Business Review.
- [30] Lee, David Kua Chuen and Low Linda (2018) Inclusive Fintech: Blockchain, Cryptocurrency and ICO. World Scientific Publishing Co. Pte. Ltd, Singapore
- [31] Library of Congress (2018) Regulation of Cryptocurrency Around the World; <https://www.loc.gov/law/help/cryptocurrency/regulation-of-cryptocurrency.pdf> (accessed 04/04/2021)
- [32] Marco Iansiti and Karim R. Lakhani (2017) The Truth About Blockchain, Harvard Business Review, January 2017
- [33] Nantogmah D, Sampson V. E. and Odoo A. A. (2021) *Political economy of digital currency in Africa: design, technology and regulation*, BTU Discussion Paper No.3, August.
- [34] Ngozi E. Egbuna (2019) Workshop on Payments Systems: Payment System Experience in the West African Monetary Zone (WAMZ), Association of African Central Banks (AACB), Cairo, Egypt, April 13 – 20, 2019
- [35] Nkrumah Kwame (1963) Africa Must Unite, Special Edition (Reprint), Kwame Nkrumah Pan African Centre, Accra
- [36] Reuters (2020) How bitcoin met then real world in Africa , <https://www.reuters.com/article/us-crypto-currencies-africa-insight-idUSKBN25Z0Q8> (accessed 12/04/21)
- [37] Saiedi Ed, Brostrom Anders and Ruiz Felipe (2021) Global drivers of cryptocurrency infrastructure adoption, Small Business Economics, no.57, pp. 354 – 406; <https://link.springer.com/article/10.1007/s11187-019-00309-8> (accessed 20/10/2021)
- [38] Scardovi Claudio (2017) Digital Transformation in Financial Services, Stringer International Publishing, London, UK pages 65-79
- [39] Stiglitz Joseph E. (2016) the EURO: How a Common Currency Threatens the Future of Europe, W.W. Norton & Company, London

- [40] Szabo, N. (2008) Bit Gold. Unremunerated: An unending Variety of Topics. <http://web.archive.org/web/20060329122942/http://unenumerated.blogspot.com/2005/12/bit-gold.html> Thursday, December 29, 2009 (accessed 15/03/2021)
- [41] Szabo, N (1997a) Formalizing and Securing Relationships on Public Networks. First Monday 2, no, 9, 1 September, 1997, <https://firstmonday.org/ojs/index.php/fm/article/view/548> (accessed 15/03/2021)
- [42] Szabo, N. (1997b) Contracts with Bearer. Nick Szabo's Essays, [https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/bearer\\_contracts.html](https://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/bearer_contracts.html) (accessed 15/03/2021)
- [43] United States Congress (2020) Bill: Crypto-Currency Act of 2020, <https://www.congress.gov/bill/116th-congress/house-bill/6154/text?q=%7B%22search%22%3A%5B%22crypto-currency+act%22%5D%7D&r=1&s=2>
- [44] World Bank (2021) Remittance Prices Worldwide Report, No. 37, The World Bank, Washington, DC

Chart 1a: P2P trading volume vs. Naira-USD exchange rate



Chart 1b P2P trading volume vs. rand-USD exchange rate

South Africa's P2P volume in USD and USD-ZAR exchange rate | Jul '19 - Jun '20

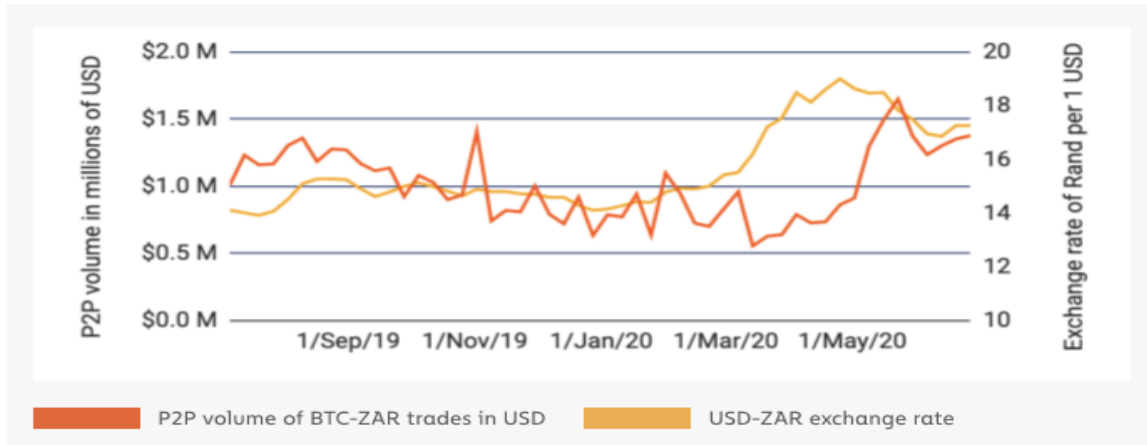
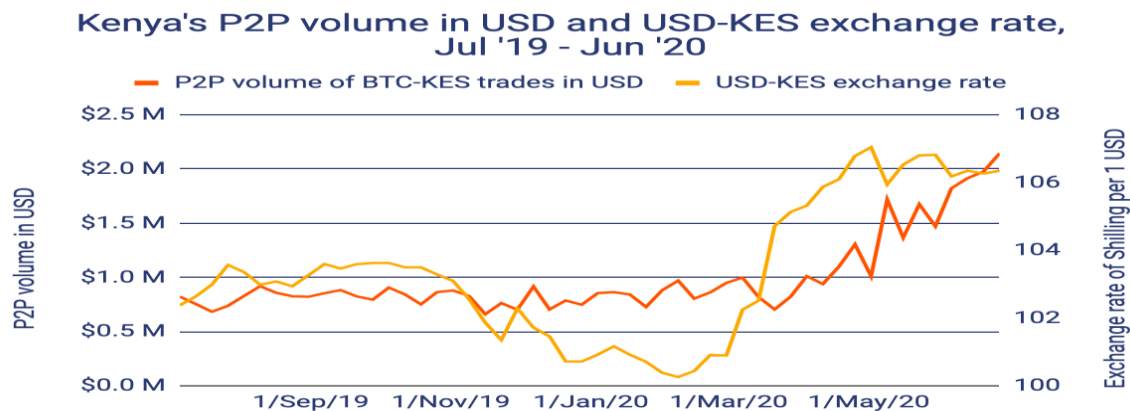


Chart 1c: P2P trading volume vs. Shilling-USD exchange rate



Box 1: P2P cryptocurrency trading volumes vs. USD-Local currency exchange rate

Sources: Chainalysis, 2020, p.17; 2021, p.114