

CRYPTO CURRENCY : AN ALTERNATIVE FOR MONETARY SOVEREIGNTY IN DEVELOPING COUNTRIES ?

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ABSTRACT

In Africa, the population over the age of 15 uses banking services with a bank penetration rate of 18.03%. This situation, which tends to improve, is favored by the advent of the internet and technological advances that have introduced new digital and virtual monetary systems. According to the European Bank, virtual currency is a type of unregulated digital money, issued and generally controlled by its creators; it is used and accepted among the members of a specific virtual community. Therefore, it is a dematerialized currency that circulates only through the internet network and can fulfill the main functions of a general equivalent. Although digital, it serves as a medium of exchange, a store of value, and a unit of account. In this context of dematerialization of the financial system, it meets an economic necessity; and its role in financial inclusion is undeniable. In Africa, its presence is increasingly felt. Indeed, it positions itself as a serious alternative to traditional currency in several emerging and developing economies. Our analysis shows that its use is very limited; in its current form, its use as fiat money remains hypothetical.

Keywords : Crypto Currency, Blockchain, Digital Finance.

Classification JEL : E22, F33, G11, G22

INTRODUCTION

In countries where a large part of the population lacks a regular banking account and does not use credit cards, consumers are turning to digital wallets through mobile platforms. This is the case in Sub-Saharan Africa, where there has been a drastic increase in the number of mobile money users, rising from 75 million to 338 million between 2012 and 2018 (Hanan Idoudi, 2020). In the same vein, we observe a growing interest among Africans in cryptocurrencies as an alternative solution for savings, transactions, and payments. Indeed, the increase in consumer demand, the inaccessibility of financial services in most developing countries, the lack of financial literacy, the distrust in the traditional banking system, the low income levels of the population, the high inflation observed in certain African countries, and the challenges associated with opening a bank account on the continent are all factors that illustrate how cryptocurrencies, based on a principle of decentralization and absence of a trusted third party, offer an alternative to the disastrous policies of the banking system (Vedie, 2019).

In Africa, a very large portion of the population does not have access to traditional financial services; this explains the low rate of banking penetration and the inaccessibility of the traditional financial system. Most banks have shifted to becoming investors, buying risk-free Treasury bonds at comfortable rates, rather than engaging in micro and nano credits with very low returns. Moreover, a significant portion of the informal economic agents is left out, completely ignored by the system as a whole (both the banking and decentralized financial

systems); these are the economic operators with very low incomes (representing 70% of the agents in the informal system).

Such a situation, which exposes the failures of the financial system, prompts economic agents to question the reality of financial inclusion in Africa. In this context, a solution that could plausibly come from the dematerialization and digitalization of the monetary system becomes imperative. Therefore, it seems timely to ask the following question : Is cryptocurrency an alternative for monetary sovereignty in Africa ? To answer this, the present article will analyze the feasibility of monetary digitalization, considering its benefits for the economic agent and the energy and ecological challenges inherent in the use of crypto finance.

The Use of Crypto Finance

In comparison to traditional financial instruments, cryptocurrencies offer several advantages for Africans. Beyond e-commerce, they provide macroeconomic benefits such as a hedge against hyperinflation, as witnessed in Zimbabwe, Uganda, and Nigeria. Youssef (2018) notes, "Africans are converting their savings into cryptocurrency to shield it from hyperinflation. For instance, the Nigerian Naira lost 90% of its value against the US Dollar and the Euro over the past two years, while Bitcoin saw a remarkable surge of over 1000% in just 2020 alone."

Ganne (2018) reports that 37% of Bitcoin holders in Zimbabwe are seeking to protect their capital from sudden depreciation, as the country, with over 80% unemployment, lost nearly half of its GDP since the 2000s. The case of Zimbabwe in 2015 is also noteworthy, with the printing of a virtually worthless 100 trillion Zimbabwean dollar note. Its dire economy has driven its populace to turn to Bitcoin (BTC) as a safe haven. Additionally, between 2016 and 2017, South Sudan experienced an inflation rate of 102%. Hence, cryptocurrencies are emerging as a solution to the severe inflation experienced in some African countries.

For Bitcoin, the limited quantity of cryptocurrencies, the halving, and the pre-determined emission rate set by the Nakamoto protocol are factors contributing to its deflationary nature. Beyond escaping inflationary monetary policies that erode savings, cryptocurrencies also reduce exorbitant exchange fees at the transactional level.

The lack of banking infrastructure in Sub-Saharan Africa, where many households lack bank accounts, contributes to high financial transaction costs. This limits the opportunities for micro-entrepreneurs to expand their activities nationally and internationally. Furthermore, transferring funds to Africa can be costly, slow, and complex with the traditional system. Africans are increasingly turning to money transfer services such as mobile money platforms (Jean-Pierre Landau, 2018). Although their service fees are slightly lower than those of commercial banks, mobile money fees are much more affordable as they are nearly nonexistent. By eliminating intermediaries, virtual currencies offer instant and inexpensive access to financial services, saving money on fees, increasing purchasing power, and enhancing the saving capabilities of families and businesses.

Evidently, cryptocurrencies represent a simple and advantageous alternative for money transfer and exchange activities. They enable a considerable volume of fund transfers due to the absence of a transaction ceiling. Specialized platforms like NairaEx (Nigeria), Abra (Malawi and Morocco), and GeoPay (South Africa) are used for capital transfers by African migrants, especially in Ghana, Zimbabwe, Uganda, Sierra Leone, and Rwanda. The African continent thus demonstrates a strong interest in digital finance. According to Citibank (2018), three

African countries are in the global top 10 for Bitcoin holdings : Nigeria, with investments representing 3.4% of the country's GDP in 2017 ; Kenya, with 2.3% ; and South Africa, with 2.1%. This illustrates the significant volume of cryptocurrency transactions in these countries.

Given the potential for massive adoption of cryptocurrencies in Africa, monetization platforms are increasingly establishing themselves on the continent. In the same vein, many trading companies targeting primarily Sub-Saharan African countries have been launched. In 2017, the Kenyan startup BlazeBay created the cryptocurrency Nuru coin, primarily targeting businesses and investors in the e-commerce sector.

In 2017, German companies MyBucks and Naga Group signed a partnership agreement to enable 1.5 million Africans to trade digital currency. The partnership involves implementing Naga Group's multi-cryptocurrency wallet into MyBucks' mobile money platform interface, allowing users to send, receive, and convert cash into cryptocurrencies received via email.

Beyond the low costs and high transaction volumes, the speed of transactions is another advantage for digital currency. Where an international bank transfer can take several days, a cryptocurrency transfer is typically completed in about ten minutes (Énée Bussac, 2018). The traditional banking system's slowness is due to clearinghouses and checks aimed at combating fraud and corruption. This time-saving aspect is a considerable advantage for economic agents.

Banks are not indifferent to the growing interest in cryptocurrencies and the associated blockchain technology. According to (Ribeiro, 2016), a consortium of the nine largest Wall Street banks was formed to develop the use of blockchain in the financial sector. By utilizing the distributed network and adapting it to current services and systems, banks could ensure greater transparency in data management while reducing operational costs and maintaining regulatory compliance.

Many people mistakenly believe that cryptocurrencies are too complicated to understand and use. In reality, they are accessible to everyone, as they do not require technical skills or in-depth understanding. Access to the internet and a cryptocurrency wallet, or acquiring one through an exchange platform, is sufficient (Sylvain Tessier, 2019). Cryptocurrencies are open to all, including those in remote regions where certain financial services are unavailable. Privacy is one of the main features of cryptocurrencies. The system does not require the disclosure of personal data, allowing for anonymity and concealing transaction costs.

Energy Challenges in Crypto Currency

Cryptocurrency emissions and transactions are based on proof of work, which entails fierce rivalry among miners and a global competition for computing power. The objective is to perform the maximum number of hashings, especially since a miner's earnings are proportional to the proof of work.

This competition results in an exponential increase in the number of hashes performed, observable through the curve of the hashrate. For instance, with Bitcoin, amidst soaring prices, the "halving" mechanism planned in the Nakamoto protocol is significantly limited in its role as a regulator and normalizer of the digital financial system. The computational power required for mining translates directly and proportionally into electrical consumption. Therefore, cryptocurrency issuance is only feasible if energy is abundantly available. For example, El Salvador, having recently legalized cryptocurrency as state currency, plans to mine it using the energy from its volcanoes.

Given their high energy needs based on proof of work and their energy-intensive nature, cryptocurrencies raise critical questions about their ecological and environmental impacts. The method of calculating this consumption has been the subject of several studies and critiques (Hubert de, 2017), particularly since neither the number nor the identities of the miners are known, as they do not communicate due to competitive concerns. Consequently, electrical consumption can only be estimated using different methods.

However, a minimal evaluation is possible using the so-called economic calculation technique of Delahaye (2019).

The formula is as follows:

Annual Energy Consumption in Terawatt-hours (TWh) :

$$((B * 12.5 * 6 * 24 * 365) + RC) * RDG * PE * CA / (EL * 10^9)$$

Based on the following assumptions:

- B: The value of the cryptocurrency at the time of estimation (Bitcoin is considered for ease of calculation);
- 12.5 represents the Bitcoin reward per proof of work as defined by the protocol;
- 6 is the number of transaction validations per hour as defined by the protocol;
- 24 represents a full workday;
- 365 represents a full work year;
- RDG: the expense/gain ratio deemed acceptable by a miner;
- PE: the percentage of expenditure devoted to energy purchases;
- EL: the price of electricity;
- RC: the annual revenue from transaction fees, here considered negligible;
- CA: the attenuation coefficient, used to safeguard against cryptocurrency price fluctuations, knowing that network power adjustment does not happen simultaneously.

Considering :

- The current Bitcoin value of 22.025.512,50 FCFA ;
- RC = 0 ;
- RDG : 1;
- PE : 60%;
- CA = 1 ;
- EL : 103 FCFA/kWh,

The Formula :

$$((B * 12.5 * 6 * 24 * 365) + RC) * RDG * PE * CA / (EL * 10^9)$$

Yields an annual consumption of :

$$((22,025,512.50 * 12.5 * 6 * 24 * 365) + 0) * 1 * 0.60 * 1 / 103 * 10^9 = 84 \text{ TWh}$$

This value represents the energy consumption for a year of mining a cryptocurrency by a Senegalese economic agent. Even if we consider that the total cryptocurrencies in the economic zone are equivalent to the M1 money aggregate, we can use the Delahaye (2019) multiplier coefficient of 1.5 to mitigate costs and place ourselves in a pessimistic scenario. Hence, for all miners with the minimal multiplier coefficient, we end up with a total annual consumption of 126 TWh. This demonstrates that the current practice of cryptocurrency production on the

blockchain is unattainable for African countries in terms of energy consumption. Such financial practice risks nullifying all the development efforts already made on the African continent.

CONCLUSION

After a thorough examination of the multifaceted benefits of cryptocurrencies, it becomes increasingly evident that this technology harbors significant potential for developmental strides in Africa. Cryptocurrencies, with their inherent features of decentralization, transparency, and security, present an innovative avenue that could revolutionize various sectors, including finance and commerce. Their ability to facilitate faster and more cost-effective transactions, bypassing traditional banking systems, positions them as a potentially game-changing tool for economic growth and financial inclusion in African nations.

However, the implementation and widespread adoption of cryptocurrencies in Africa are not without their challenges and complexities. One of the primary concerns revolves around the volatility and regulatory aspects of the cryptocurrency market. The fluctuating values of digital currencies pose a risk to stability and predictability in economic transactions, which is a critical aspect for any developing economy. Furthermore, the lack of a comprehensive and harmonized regulatory framework for cryptocurrencies adds to the uncertainty and potential for misuse, making it imperative for African nations to develop robust legal structures to govern their use.

Beyond regulatory and security concerns, a major impediment in the path of adopting cryptocurrencies in Africa is the significant energy demand and ecological impact associated with cryptocurrency mining. The intensive computational processes needed for validating transactions and mining new coins, predominantly based on the Proof of Work (PoW) model, lead to enormous energy consumption, contributing to environmental degradation. This is particularly concerning for African countries, many of which are grappling with energy deficits and are increasingly conscious of their environmental responsibilities. The sustainability of cryptocurrencies, therefore, becomes a critical factor to consider, urging a shift towards more energy-efficient consensus mechanisms like Proof of Stake (PoS).

The security of platforms for cryptocurrency transactions and monetization is another critical area that requires attention. The decentralized nature of blockchain, while offering advantages in terms of transparency and resistance to tampering, also makes these platforms a target for cybercriminals. Instances of hacking, including the falsification of private keys and the introduction of malware and viruses into the blockchain, highlight the need for heightened cybersecurity measures to protect users and their assets.

In the context of Africa, where many economies are still developing and are characterized by their fragility, the adoption of cryptocurrencies and their associated technologies presents both opportunities and challenges. While they offer an alternative to traditional financial systems and promise enhanced financial inclusion, especially in unbanked or underbanked regions, their integration into the economic fabric of African nations must be approached with caution. A gradual and well-thought-out implementation strategy, aligned with the specific needs, capabilities, and energy policies of individual countries, is essential. This approach should be complemented by efforts to foster digital literacy and build infrastructure conducive to digital technologies.

Moreover, the successful integration of cryptocurrencies in Africa will likely require coordinated efforts at a supranational level. The establishment of common standards and regulatory frameworks across nations can mitigate risks and harmonize practices, paving the way for a more secure and efficient use of digital currencies. Such supranational standardization efforts would also facilitate cross-border transactions, fostering regional economic integration and development.

While cryptocurrencies present a promising avenue for economic growth and development in Africa, their adoption must be strategically managed, balancing the potential benefits with the challenges they pose. Careful consideration of the economic, regulatory, security, and environmental implications is crucial to ensure that the embrace of digital currencies contributes positively to the continent's growth and development trajectory.

Webography

<https://scilogs.fr/complexites/evolution-des-crypto-monnaies/>

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Received: 29-Dec-2023, Manuscript No. IJE-24-14406; **Editor assigned:** 02-Jan-2024, Pre QC No. IJE-24-14406; (PQ); **Reviewed:** 17-Jan-2024, QC No. IJE-24-14406; **Revised:** 22-Jan-2024, Manuscript No. IJE-24-14406; (R); **Published:** 30-Jan-2024