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Crypto Currencies and Financial Stability in Developing Countries: The Case of Nigeria

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Abstract

The global economy has faced major challenges in recent years. Since the COVID-19 pandemic, these challenges have created greater economic volatility, uncertainty, complexity, ambiguity and can lead to financial instability as the global financial system remained weak. According to the importance of financial stability, as a public good, international institutions, in the aftermath of the global pandemic, are urging national governments to implement policies that mitigate the risk of financial instability. Relating to financial market environment, this recommendation means that the expansion of cryptoasset subject to speculation, even attractive for market operators, should be restricted. However, Nigeria, the second most Bitcoin-using country in the world, lifted its ban on cryptocurrency transactions in December 2023. This decision is a recognition of the benefits of cryptocurrencies for developing countries and suggests that they have no significant impact on financial stability in these countries. This paper therefore aims to empirically assess the effect of the use of cryptocurrencies on financial stability in Nigeria in order to account for the magnitude of the impact of crypto asset market shocks on financial stability. To do this, we estimated the long-run cointegration relationship between the Z-score, a proxy for financial stability, the volatility of the bitcoin price and other marcoeconomic variables determining financial stability, using the generalized method of moments. The results show that the increased use of bitcoin in Nigeria will damage financial stability in the long run. It is therefore essential for the country, while capitalising on the opportunities offered by cryptoassets to make international transfers, escape the depreciation of the Naira and invest in digital assets, to regulate their use and guarantee protection for investors.

Keywords: Cryptocurrencies, financial stability, volatility, risk.
Jel codes: G23

1. Introduction

The global economy has faced major challenges in recent years. Since the COVID-19 pandemic, these challenges have created greater economic volatility, uncertainty, complexity, ambiguity (VUCA) and can lead to financial instability as the global financial system remained weak[1]. According to the fact that financial stability, as a public good, is the pillar of prosperous, balanced, and sustainable growth, international institutions, in the aftermath of the global pandemic, are urging national governments to implement policies that mitigate the risk of financial instability. Relating to financial market environment, this recommendation means that the expansion of assets vulnerable to speculation and supposed to amplify financial risks should be restricted.

[1] The global financial system remained weak in the review period, largely as a result of tight monetary and financial conditions, geopolitical tensions, particularly the protracted Russia - Ukraine crisis with its disruptive effects on global supply chains management (Central Bank of Nigeria, 2023; IMF, 2023). Other key factors that shaped the financial system included, high debt levels and limited fiscal buffers in several economies (Central Bank of Nigeria, 2023).

In fact, financial markets have undergone a radical transformation and rapid expansion over the last three decades, encouraged by deregulation, liberalisation and the rapid development of structural innovations relating to information and communication technologies and digital technology. In recent years, these have led to the creation and explosion of a new asset class that is attractive to market operators (Yan et al., 2022): cryptocurrencies.

A cryptocurrency[2], also known as a cryptoasset, is a peer-to-peer electronic currency that can be used via a decentralised computer network based on blockchain technology. Contrary to received and accepted ideas, in this case the idea that central banks govern the monetary and financial sphere, this new asset class, which enables transactions to be issued and settled without the intervention of central banks, is increasingly being deployed outside their control. Since the creation of bitcoin[3] in 2009, there have been more than 24,000[4] cryptocurrencies worldwide, and the market value of crypto assets has risen exponentially. According to data presented by Coin Market Cap, the combined market capitalisation of crypto currencies reached $2.55 trillion[5] in April 2024.

In 2023, 14 of the top 20 countries with the highest share of population owning cryptocurrencies were developing countries in Africa, Asia and South America (Chainalysis, 2024)[6]. Some countries such as El Salvador, the Central African Republic, Venezuela, Vietnam and Argentina (les echos, 2022, 2024) recognise cryptocurrencies as legal tender. This undoubtedly reflects the recognition of the advantages and opportunities that cryptocurrencies offer to the economic world and that developing countries wish to capitalize on.

For developing countries, cryptocurrencies are an alternative to banking systems and an accessible, transparent and efficient financial alternative. By facilitating access to an online bank account, access to costly banking infrastructure in the traditional system, they promote financial inclusion, and therefore access to loans and payment instruments. They also help to reduce costs[7] and transaction times for international transfers (Banque mobdiale, 2022). In countries with high inflation and exchange rate instability, they provide a means of storage to protect savings and the cost of living from economic fluctuations (Lankes, 2022)[8]. In Argentina for example in 2022, bitcoin was used by households and businesses to cope with inflation close to 90% and peso devaluations (Herrera, 2022)[9]. As another potential benefit, cryptocurrencies promote investment, participatory financing[10] and the fight against corruption because transactions are traceable and transparent (Carrol and Carrol, 2018)[11] ; all of which help to stimulate economic growth and growth in national per capita income.

Despite these factors, which make them highly rated in developing countries, a study carried out by the Bank for International Settlements' Consultative Group of Financial Stability Directors in 2023[12] highlighted that the heavy use of cryptocurrencies amplifies existing financial risks in less developed economies. As a result, many countries such as China, Egypt and Qatar have completely banned digital currencies and the services surrounding crypto currencies, and many central banks have embarked on projects to create "Central Bank Digital Currencies" to offer investors a reliable substitute for crypto currencies.

Although this requirement, Nigeria, the country using bitcoin the most in Africa (chainalysis, 2022) to make international transfers, escape the depreciation of the Naira and invest in digital assets, in December 2023 lifted[13] its ban on cryptocurrency transactions. This shows the impact of cryptocurrency in challenging traditional financial systems, in promoting financial freedom in various countries. Implicitly, this decision suggests that cryptocurrencies pose no risk to Nigeria's financial stability.

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[2] Grand Dictionnaire terminologique, Office québécois de la langue française (consulted on 23 January 2024).
[3] Bitcoin (abbreviation: BTC; sign: ₿) is the first decentralised cryptocurrency.
[4] "Cryptocurrency Prices, Charts And Market Capitalizations", on CoinMarketCap (accessed 28 April 2024).
[5] With bitcoin worth $1.240 trillion, followed by Ethereum worth $388 billion, Tether worth $110 billion and the BNB coin worth $87 billion.
[6] The 2023 Global Crypto Adoption Index: Central & Southern Asia Are Leading the Way in Grassroots Crypto Adoption, https://www.chainalysis.com/blog/2023-global-crypto-adoption-index/
[7] Less than 1% compared with fees of up to 20% in the traditional system.
[8] Ana Lankes (2022): Crypto is tumbling, but in Argentina it's still a safer bet, New York Times, (accessed 21 February 2024).
[9] Yoanna Herrera, (2022): Cryptomonnaies, la nouvelle valeur refuge des Argentins, Les echos (accessed 22 February 2024).
[10] Start-ups can raise funds on a global scale without necessarily going through traditional funding channels.
[11] Enrique Aldaz-carroll and Eduardo Aldaz-carroll (2018): Cryptocurrencies and blockchain technology: new weapons against corruption, Worldbank blogs, accessed 08 February 2024.
[12] Consultative Group of Directors of Financial Stability (CGDFS): Financial risks from cryptoassets in emerging market economies, BIS papers N. 138, 2023.
[13] In Nigeria, cryptocurrency was completely banned and illegal. Even the Central Bank of Nigeria (CBN) ordered banks across the country to close the accounts of anyone working with cryptocurrencies.

The above developments lead us to formulate the following research questions: do crypto currencies really have an effect on financial stability? More specifically, what is the magnitude of the impact of shocks to crypto asset markets on financial stability?

In spite of the abundant literature on crypto currencies in Africa, few empirical studies have addressed the threats of financial instability that crypto currencies pose to economies. Thus, the main objective of this article is to assess the effect of the use of crypto currencies on financial stability in Nigeria. Such a study has a number of interests. Scientifically, it will firstly highlight the current debate on the relevance or irrelevance of crypto-currencies. Secondly, unlike the work on the subject which has so far been limited to theoretical or even hypothetical considerations, this study will make it possible to establish an objective and above all empirical link between cryptocurrencies and financial stability by focusing on the singular case of Nigeria.

The rest of this article is organised as follows: the second section is devoted to the literature review and the third section to the presentation of the methodology and indicators used for the analysis. The preliminary empirical results are presented in the fourth section, and the fifth section is devoted to the conclusion.

2. Literature review

2.1.Theoretical framework

There has been a lot of talk in the economic world about the monetary nature of crypto-currencies, among other things. This conceptual opposition concerns the traditionalists or functionalists on the one hand, and the neoliberals and libertarians on the other. According to the classical monetarists, functionalists and traditionalists, crypto-currencies are not currencies or do not fulfil the functions of a currency, whose concept they radically challenge. As Dyhrberg (2016) points out, the place of crypto- currencies, in this case bitcoin, is in the financial markets and in portfolio management, given that they are currently highly volatile and sensitive to speculative bubbles. Functionalists refute the monetary nature of crypto-currencies by describing them as crypto-assets.

For the promoters (Libertarians and liberals) of crypto-currencies, these are virtual currencies that circulate on the Internet. They fulfil the same functions as a traditional currency: they represent a unit of account, which means that they can be used to measure the value of a good or service, for example to determine that a pair of socks is worth 1 Bitcoin. It facilitates exchanges, i.e. it can be used to buy goods and services. And it can be stored for future use. In this sense, Bitcoin can be described as a "currency", in the same way as the euro, for example.

Depending on whether you're on one side or the other, crypto currencies seem to have a negative or positive effect on the financial system.

2.2. The nexus between crypto assets and financial stability

Financial stability refers to a situation where a financial system has low volatility, i.e. low or slow capital movements.

The issue of financial stability has always been at the centre of researchers' and politicians' concerns. After the 2008 financial crisis, new regulations were proposed to frame and supervise the financial system because of the unique nature of financial stability as a public good (Creel et al., 2015). Today, they seem to advocate limiting the expansion of cryptocurrencies because it is generally accepted that their rise could destabilise their financial systems in more ways than one.

Cryptocurrencies are unstable financial assets that are particularly vulnerable to speculation, as their value depends solely on the confidence of those who invest in them (Geny, 2022). This instability, which is characterised by increased volatility in prices that fluctuate up and down[14], leads to significant losses for investors, especially as it allows people with no financial knowledge or education to enter the markets (Panigrahi, 2023). Thus, due to exposure to crypto-asset markets, traditional financial markets may face market risk (CGDFS, 2023). In addition, investors may face liquidity risks due to the lack of transparency in crypto-asset trading and the concentration of trading on a few large crypto-currency exchanges, among other factors. Another risk is credit risk, which can materialise through the lack of accountability or sound governance in crypto asset markets. Operational risks may also arise as cryptoassets are prone to cyber attacks and system

[14] In 2019, the price of the most famous currency, bitcoin, rose from €4,000 to €7,000, peaking atalmost €11,000. In April 2024, it broke a new record, rising to over €59,000.

failures and present cybersecurity risks. For example, Panigrahi (2023) has shown that cryptocurrencies degrade financial stability in India.

In addition to these considerations, the central banks claim that the use of cryptocurrencies could lead to disintermediation of banks (CGDFS, 2023), particularly with savers fleeing to these virtual private currencies to avoid the costs of traditional deposit accounts. This lack of interest poses a risk to banking stability, as it could lead to a reduction in banks' profitability and solvency. In addition to posing a systemic risk to the stability of the financial system, private virtual currencies, in countries with high inflation and exchange rate volatility, tend to replace local currency; in this sense, they threaten the security of monetary systems and monetary sovereignty (UNCTAD, 2022). Cryptocurrencies also encourage tax evasion (Riley, 2021) and hamper the effectiveness of capital controls, a key instrument for macroeconomic stability (UNCTAD, 2022). Overall, cryptocurrencies create huge losses for economies. In 2017, Chiu and Koeppl showed that the loss associated with the use of Bitcoin was around 500 times greater than that of the monetary economy with 2% inflation.

Yet in a period of more unpredictable events, the cryptocurrency market has become a risk management tool for domestic and foreign investors in the stock and commodity markets. Sami and Abdallah (2021) have shown that there is a significant relationship between crypto currency and stock market performance. As a fundamental instrument of economic growth (Leonard and Treiblmaier, 2019b; Symss, 2023), crypto currency gave the highest returns compared to other investment instruments (Dasman, 2021). Furthermore, cryptocurrencies provide a safety net for the stock market by being a safe haven for investors (Conlon et al., 2020; Jeribi et al., 2021). They can therefore provide an alternative to traditional financial instruments during periods of financial crisis.

We can therefore agree with Beaudry (2021)[15] that crypto-currencies do not pose a significant risk to the financial system at their current level of adoption. In other words, they "are not developing in a way that creates a systemic type of risk for a financial system" because crypto-currencies are "quite remote from a financial system". Cryptos remain investment assets for the time being and are not yet fully integrated into the financial and banking sector, as investors buy digital currencies "mainly to speculate. The risk will grow as cryptos increase in popularity and become more closely integrated with the traditional system.

This lack of consensus in the literature on the relative importance of the risks compared to the gains and on the effectiveness of these risks justifies the disparity of positions that exist from one country to another and requires the real effect of crypto currencies on financial stability to be assessed on a case-by-case basis, as countries are heterogeneous from one region of the world to another.

3. Methodological approach

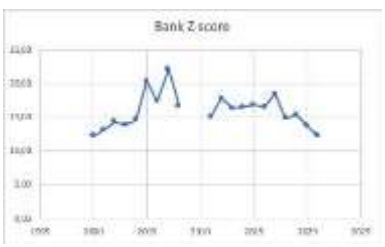
Nigeria has an extensive and relatively sophisticated financial sector, but on the ground it remains characterised by a high degree of opacity. Despite the headwinds of international economic environment, the Nigerian financial system remained resilient and stable owing largely to effective regulatory oversight and innovative policy initiatives. Accordingly, the key financial soundness indicators were within the prudential thresholds.

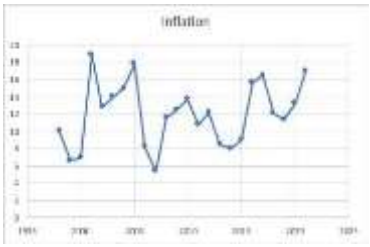
The model used to analyse the link between monetary stability and cryptocurrency use in Nigeria is inspired by the work of Mbilla et al (2021) and Panigrahi (2023). The regression equation is of the form :

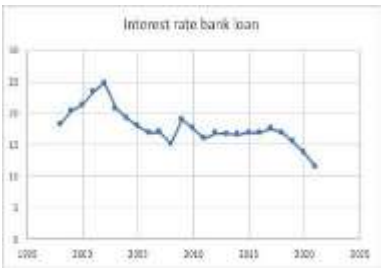
$$FSt = \alpha + \beta Zt + \delta Xt + \varepsilon t \qquad (1)$$

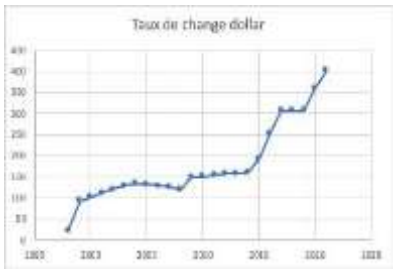
FS is the financial stability index. As in the studies by Kasman and Kasman (2015), Mare et al. (2017), Phan et al. (2021), Panigrahi (2023), the Z- score will be used as a proxy for financial stability. Z is the variable representing the dynamics of crypto- currencies: price volatility of the bictoin (BTC) or rate of expansion of their use measured pr the World Cryptocurrency Adoption Index (WCA). X a vector representing other determinants of financial stability deemed relevant, in particular those relating to macroeconomic stability and stock market volatility: the inflation rate (INF), the exchange rate (ER), the interest rate on loans granted by banks (IR), Nigeria's stock price volatility (SPV), economic policy uncertainty (PU) and the risk- free rate (RFR) calculated on the basis of the maturity of 10-year Nigerian government bonds. The graphs below show the evolution of the series in Nigeria and on the international markets.

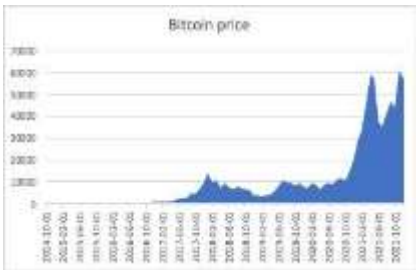
[15] Speech summary, Paul Beaudry (2021): Checking up on Canada's financial system (consulted on 09 March 2024). https://www.bankofcanada.ca/2021/11/checking-up-on-canadas-financial-system/

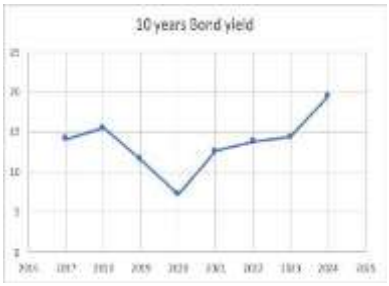












Over the period under review, Nigeria's political cycle has been marked by two economic recessions (in 2016 and 2020), two pre-campaign elections (in 2019 and 2013) and the covid-19 pandemic, all of which have kept political uncertainty in Nigeria high. In principle, this can justify the increase in the yield on Nigerian treasury bonds to over 19% in April 2024. From a macroeconomic point of view, we are seeing high volatility in consumer prices, in the price of Nigerian assets on the stock markets and an increasingly significant depreciation of the Naira against the US dollar. Between 2014 and 2021, the price of bitcoin grew by more than 14588% and the bitcoin adoption index in Nigeria grew by more than 10%.

To improve data consistency as suggested by Hollis et al. (2019), the inflation rate, exchange rate, bank lending interest rate, Nigeria global cryptocurrency adoption index and risk-free rate series were converted to quarterly data. While the Bitcoin price, Nigeria's stock price volatility and economic policy uncertainty were converted from monthly to quarterly data. The data used are quarterly time series from 2015 to 2021 and come from World Bank Development Indicators (2024), World Bank Global Financial Development Database (2024) as well as Yahoo Finance, Chainalysis and policy uncertainty.

4. Summary results

Application of the Augmented Dickey Fuller and Phillipe-Peron unit root tests shows that the variables considered in this analysis are integrated of order 1 and are stationary in difference. The long-run co-integration relationship between financial stability and crypto-currencies is estimated using the generalised moments estimator developed by Arellano and Bond (1991). The preliminary results of the estimation are reported in the table below.

Table 1. Estimation of the long-term model

Variables	**FS estimation (z score)**
BTC	-1,17*
WAC	NA
INF	-2,61**
ER	-3,47**
IR	-7,33*
SPV	-0,23**
RFR	2,92**
PU	0,179
Constant	87,58
R2	0,81

Source: author's calculations based on STATA 14 software. (*) means $p < 0.001$ and (*)means $p < 0.05$

The results of the long-term model show that all the determinants are cointegrated with financial stability, with the exception of uncertainty linked to economic volatility.

More specifically, they reveal firstly that there is a negative and significant relationship between financial stability and the use of bitcoin by Nigerians. Indeed, 10% volatility in bitcoin prices leads to an 11.7% deterioration in financial stability. So, in the long term, crypto currencies could contribute to the country's monetary and financial instability if they remain operational in an unregulated parallel financial system. This result is similar to that obtained by Panigrahi (2023) for the case of India, However, the effect of cryptocurrencies on financial stability in Nigeria remains weaker than that of the other macroeconomic variables that turn out to be significant. First, a 10% increase in the exchange rate would lead to a 34.47% deterioration in financial stability. This negative effect of exchange rate volatility has been noted in studies by Eichengreen (1998); Golovnin and Oganesian (2018).

The coefficient on political uncertainty is positive but not significant. In other words, although it is significant, it would be incapable of destabilising the Nigerian financial system in the long term.

In addition, inflation and rising bank lending rates have been found to have a strong and negative impact on Nigeria's financial stability. A 1% increase in inflation, bank lending rates and stock market volatility would reduce financial stability by 2.61%, 7.3% and 0.23% respectively.

Volatility in stock markets, interest rates and exchange rates can affect economic performance and the smooth functioning of the financial system by altering the investment spending of consumers and businesses. More specifically, investors may perceive an increase in stock market volatility as an increase in the risk of equity investments; interest rate volatility may threaten the viability of financial intermediaries; and exchange rate volatility may alter international capital flows.

On the other hand, a rise in the yield on Nigeria's 10-year bonds improves financial stability. Indeed, if bond yields rise, existing bonds lose value; the 10-year note is undoubtedly a very important benchmark for global financial markets, and so a rise in yield indicates investor confidence in the economy.

5. Conclusion

The aim of this article was to empirically assess the effect of the use of crypto currencies on financial stability in Nigeria. More precisely, it aims to estimate the magnitude of the impact of crypto asset market shocks on financial stability in Nigeria. To do this, we estimated the long-run cointegration relationship between the Z-score, a proxy for financial stability, the volatility of the bitcoin price and other macroeconomic variables that determine financial stability, using the generalized method of moments. The results show that there is a negative and significant relationship between financial stability and the use of bitcoin by Nigerians. A bitcoin price volatility of 10% leads to a deterioration in financial stability of 11.7%. This effect is smaller than that obtained by Panigrahi for the case of India and can be justified by the relatively low level of development of the Nigerian financial system, which does not yet allow close integration of crypto assets. However, it remains true that the increased use of bitcoin in Nigeria will damage financial stability in the long term. It is therefore essential for the country, while capitalising on the opportunities offered by cryptoassets to make international transfers, escape the depreciation of the Naira and invest in digital assets, to regulate their use and guarantee protection for investors.

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