Assessing global and local interest in eNaira CBDC and cryptocurrency information: implications for financial stability

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Abstract

Purpose – This paper investigates the global and local interest in Internet information about cryptocurrency and the Nigeria central bank digital currency, which is also known as eNaira.

Design/methodology/approach – Granger causality test and GMM coefficient matrix methodologies were used.

Findings – There is sustained increase in global and local interest in Internet information about eNaira in the first six weeks after eNaira adoption. Local interest in Internet information about cryptocurrency in Nigeria exceeded global interest in Internet information about cryptocurrency. The south-east region had the highest interest in cryptocurrency information followed by the south-south, the north-central, the north-east, the north-west and the south-west regions. In contrast, the north-east region had the highest interest in Internet information about eNaira, followed by the north-west, the north–central, the south-west, the south-south and the south-east regions. Nigeria recorded the highest global interest in Internet information about cryptocurrency and eNaira, while Japan and Brazil recorded the lowest interest during the period. The correlation results show a significant and positive correlation between interest in cryptocurrency information and interest in eNaira information. The Granger causality results show that global interest in cryptocurrency information causes both global and local interest in eNaira information. Also, local interest in cryptocurrency information causes global interest in eNaira information. The GMM regression coefficient matrix shows a significant positive relationship between interest in cryptocurrency information and eNaira information.

Originality/value – There are few studies on CBDC in country-specific contexts. This study adds to the literature by examining the Nigerian context.

Keywords Internet, Information, Trends, eNaira, Cryptocurrency, Central bank digital currency, CBDC, Bitcoin

Paper type Research paper

1. Introduction

This paper investigates the global and local interest in Internet information about Nigeria central bank digital currency, which is also known as eNaira, relative to cryptocurrencies. A central bank digital currency (CBDC) is the electronic money issued by central banks, which is also a liability of the central bank (Gupta, 2021). On the other hand, cryptocurrencies are decentralized digital currencies for executing payments over the Internet and which do not require financial institutions to execute payments. Cryptocurrencies are issued and controlled by its developers, and used and accepted among the members of a specific

virtual community. Cryptocurrencies are neither issued by a central bank or a public authority and are not attached to a fiat currency (with the exception of stablecoins).

Cryptocurrencies have grown in popularity and valuation, and are posing a threat to fiat paper money in a fast-changing digital environment. Central banks have begun to respond to the fast-changing digital environment by creating a digitized version of their respective currencies. China has launched the e-yuan, the Bahamas has launched the sand dollar and Nigeria has launched eNaira. In Nigeria, eNaira is a digital version of fiat paper currency. It is a tiered-structured central bank digital currency [1]. It has some benefits. It is a faster and reliable cross-border payment alternative; it increases financial inclusion; it increases the security of users; and it improves payment efficiency while preserving security. It is designed to be used alongside cash and banknotes, and it could replace most user deposits in retail banks.

Despite the benefits of eNaira, there have been some concern about the level of interest in eNaira by citizens given the already high appetite for cryptocurrency and high interest in cryptocurrency in Nigeria. Many have argued that eNaira could collapse because many people in Nigeria will not use it. Others argue that the appetite for cryptocurrency in Nigeria is so strong that it would crowd out any appetite for eNaira CBDC. Some have also argued that eNaira will not succeed because alternative payment channels are working very well such as bank apps, ATMs, debit cards and point-of-sales (POS) machines. Given these sentiments, it is important to assess the level of interest in eNaira CBDC relative to cryptocurrency.

This paper looks at this issue by focusing on interest in Internet information about eNaira CBDC and cryptocurrency. This paper used the interest in Internet information about eNaira and cryptocurrency as a proxy for people's interest in eNaira CBDC relative to cryptocurrency, because the Internet is the only reliable worldwide channel through which information about eNaira CBDC and cryptocurrency can be communicated. Using global data and data for Nigeria over a 40-week period, the findings reveal that there was sustained increase in global and local interest in Internet information about eNaira in the first six weeks after eNaira adoption. Local interest in Internet information about cryptocurrency in Nigeria exceeded global interest in Internet information about cryptocurrency. The south-east region had the highest interest in cryptocurrency information followed by the south-south, the north-central, the north-east, the north-west and the south-west regions. In contrast, the north-east region had the highest interest in Internet information about eNaira followed by the north-west, the north-central, the south-west, the south-south and the south-east regions. Nigeria recorded the highest global interest in Internet information about cryptocurrency and eNaira, while Japan and Brazil recorded the lowest interest during the period. There is a significant and positive correlation between interest in cryptocurrency information and interest in eNaira information. There is a significant positive relationship between interest in cryptocurrency information and eNaira information.

This paper contributes to academic knowledge by providing a comprehensive analysis of the interest in eNaira based on interest in Internet information about eNaira relative to cryptocurrency. Secondly, the paper contributes to the information literature by showing how information about money innovation spreads within a country. Thirdly, the paper adds to the central bank digital currency literature by focusing on the regional and local interest in eNaira CBDC. It contributes to our understanding in the literature about how the population would receive digital currencies. Finally, the paper adds to the debate about the relevance of cryptocurrency in countries. As cryptocurrencies begin to overshadow CBDCs, there might be calls for cryptocurrency regulation or its outright ban.

The rest of the paper is structured as follows. Section 2 presents the literature review. Section 3 presents the research methodology. Section 4 presents the empirical results. Section 5 presents the conclusion.

2. Literature review

2.1 The diffusion of innovations theory

This study builds on Rogers' (2003) diffusion of innovations theory. The theory describes the pattern and speed at which new innovations spread through a population. It attempts to explore factors that influence an individual to adopt an innovation or a new technology (Md Nor *et al.*, 2010). The theory suggests five key beliefs that influence the adoption of any innovation: relative advantage, complexity, compatibility, trialability and observability (technology (Md Nor *et al.*, 2010). The theory also argues that information about new innovations is diffused or communicated through certain channels to members of a social system or the population (Rogers, 2003). The theory argues that the channel through which information about new innovations is communicated can greatly influence how people respond to the innovation, and would give rise to early adopters, early majority adopters, late majority adopters and laggards (Rogers, 2003). The implication of the diffusion of innovations theory for this study relates to the channel through which new innovations are communicated. Existing studies show that information can be diffused through word-of-mouth (Chevalier and Mayzlin, 2006) or opinion leaders (Valente and Davis, 1999). This study focused on the "Internet" as the major channel through which information about eNaira and cryptocurrency is communicated to the population. This allows us to assess the pattern of interest in Internet information over eNaira and cryptocurrency over time.

2.2 Debates about cryptocurrency and central bank digital currency

In the literature, there are debates about what would happen to cryptocurrencies when there is widespread adoption of central bank digital currency. Bolt *et al.* (2022) argue that CBDC and cryptocurrencies should be allowed to coexist in order to get the best of the innovation and trust which the two offer. However, they emphasize that it is important to get the balance right by regulating cryptocurrencies and stablecoins while also adopting CBDC in the same payment system. Gupta (2021) adds to the debate by emphasizing that CBDC and cryptocurrency have very little in common due to the primary structural differences between them, and that CBDC has an upper hand because CBDC would take advantage of the digitization of money in the areas of monetary policy transmission and financial inclusion, which is not possible with cryptocurrency due to its various limitations. Ozili (2022a) contributes to the CBDC-cryptocurrency debate by stating that the widespread adoption of CBDC would lead to calls to regulate cryptocurrency and may lead to the acceptance of stablecoins if they are regulated even though the benefits of stablecoins do not outweigh the benefits of issuing a central bank digital currency. Ozili (2022a) also argues that the benefits of CBDC for society outweigh the risks, thereby making CBDC more attractive than cryptocurrency. Fuchs (2022) shows that, although private cryptocurrencies allow for payments without the need for a financial institution, the central bank can introduce an interest-bearing central bank digital currency that would provide a payment system which is superior to cryptocurrencies. And since cryptocurrency miners cannot match the CBDC deposit interest rate, they would go bankrupt. This way, the central bank is able to tilt the payment system in favor of CBDC until it wins. Ozili (2022b) also argues that the issuance of a central bank digital currency can lead to the collapse of private digital currencies because central banks can leverage on their monetary powers, and the trust that citizens have in government-backed money. Central banks can issue a CBDC which can erode trust in cryptocurrencies and lead to lack of trust in cryptocurrency, thereby leading to the collapse of cryptocurrencies, although not immediately (Ozili, 2022b).

2.3 Studies on eNaira

Regarding eNaira central bank digital currency, there is a scant literature about eNaira. The few existing studies such as Ozili (2022c) show that eNaira offers opportunities such as the

potential to improve the conduct of monetary policy, increase convenience, efficient payments and increase financial inclusion, while the risks posed by eNaira include digital illiteracy, increased propensity for cyber-attacks, data theft and the changing role of banks in a full-fledged CBDC economy. Esoimeme (2021) identifies the implication of eNaira for financial inclusion and anti-money laundering and combating the financing of terrorism (AML/CFT). The author argues that eNaira can increase financial inclusion and mitigate AML/CFT risks, but the use of eNaira may be affected by the poor culture of compliance, employee fraud and money laundering (Esoimeme, 2021). Chukwuere (2021) shows that eNaira can assist Nigerians to access their money quickly, and the central bank can monitor and control transactions. However, the major challenge of eNaira is the issue of trust in eNaira (Chukwuere, 2021). Fabian *et al*. (2022) also show that eNaira can improve the financial performance of Nigerian banks, improve the availability and usability of central bank money and also increase the revenue generation of the country. Ozili (2023a) shows that eNaira CBDC can increase the level of financial inclusion in Nigeria, while Ozili (2023b) finds that interest in eNaira information is significant positive determinant of interest in financial inclusion information. While these studies have examined the benefits and risks of eNaira, the above studies have not assessed interest in information about eNaira relative to interest in information about cryptocurrency. In this paper, I add to the literature by extending the information diffusion literature as well as eNaira CBDC literature. The next section presents the research methodology.

3. Research methodology

Weekly data were extracted from Google Trends database as shown in Table 1. The data were extracted for four variables: EG, EN, CG and CN. The four variables are comprehensive because the variables capture both the local and global search for information about eNaira CBDC and cryptocurrency. These variables also capture the local and global interest in information about eNaira CBDC and cryptocurrency. The first variable is the "EG" variable which measures global interest in Internet information about eNaira. The EG variable measures the interest in Internet information about eNaira by all Internet users around the world. The second variable is the "CG" variable which measures global interest in Internet information about cryptocurrency. In simple terms, the CG variable measures the interest in Internet information about cryptocurrency by all Internet users around the world. The third variable is the "EN" variable which measures local interest in Internet information about eNaira. The EN variable measures the interest in Internet information about eNaira by Internet users in Nigeria only. The fourth variable is the "CN" variable which measures local interest in Internet information about cryptocurrency. The CN variable measures the interest in Internet information about cryptocurrency by Internet users in Nigeria only. The sample period covers a 40-week period, beginning from October 25, 2021 to July 31, 2022. The sample period spans from the day eNaira was launched until the end of July in 2022.

The Google Trends data measure the interest over time or the popularity of specific keywords on the Internet. The Google Trends data are important because they show the popularity of specific keywords on the Internet in a location and over a time period. To obtain the data, I inserted the keywords "eNaira" and "cryptocurrency" into the search box in the Google Trends database. The resulting data are the EG variable (i.e. global interest in Internet information about eNaira), the CG variable (i.e. global interest in Internet information about cryptocurrency), the EN variable (i.e. local interest in Internet information about eNaira) and the CN variable (i.e. local interest in Internet information about cryptocurrency). The data output from the Google Trends database are numbers, also known as popularity count, ranging from 0 to 100. These numbers represent interest in a keyword relative to the highest point on the scale for the given location, region and time. The numbers capture the relative

Week/variable	EG	EN	CN	CG
31/10/2021	100	100	100	100
07/11/2021	67	74	86	66
14/11/2021	50	40	82	65
21/11/2021	35	27	64	77
28/11/2021	28	22	50	61
05/12/2021	38	40	46	47
12/12/2021	27	24	53	40
19/12/2021	27	22	51	37
26/12/2021	25	28	58	39
02/01/2022	21	15	96	50
09/01/2022	0	6	75	45
16/01/2022	13	13	82	53
23/01/2022	22	20	72	47
30/01/2022	20	15	67	52
06/02/2022	26	15	60	43
13/02/2022	19	18	64	37
20/02/2022	19	14	61	37
27/02/2022	8	4	63	32
06/03/2022	11	12	57	32
13/03/2022	12	15	52	28
20/03/2022	11	12	64	30
27/03/2022	12	6	63	30
03/04/2022	6	8	64	30
10/04/2022	10	5	62	29
17/04/2022	5	3	61	26
24/04/2022	8	4	63	26
01/05/2022	0	7	66	24
08/05/2022	14	6	62	47
15/05/2022	18	10	60	33
22/05/2022	16	12	55	28
29/05/2022	12	10	55	23
05/06/2022	6	5	47	20
12/06/2022	8	4	64	34
19/06/2022	12	3	50	24
26/06/2022	5	0	45	19
03/07/2022	0	5	42	16
10/07/2022	8	0	49	17
17/07/2022	9	10	41	18
24/07/2022	11	10	48	15
31/07/2022	15	9	43	17
Aggregate statistics				
Mean	18.85	16.32	61.07	37.35
Median	12.50	11.00	61.00	32.50
Maximum	100	100.00	100.00	100.00
Minimum	0.00	0.00	41.00	15.00
Std. dev	18.74	19.17	13.72	18.08
Skewness	2.56	2.86	0.99	1.35
Kurtosis	10.75	11.89	3.90	5.14
Observations	40	40	40	40

Source(s): Google Trends and author's computation

popularity of a keyword (Ozili, 2022d). A count of less than 50 indicates that interest in the keyword was relatively low. A count of 50 means that interest in the keyword is half as popular. A count of 100 means that interest in the keyword was highly popular and reached the peak popularity for the term (Ozili, 2022d). A score of 0 means there was not enough data for the search term. The data were analyzed using descriptive statistics, correlation analysis, Granger causality test and the GMM regression coefficient matrix method.

The descriptive statistic for the variables is reported in Table 1. The table shows that the EN and EG variables had higher values in the early weeks after eNaira adoption, specifically, six weeks after eNaira adoption. This suggests that there was increased global and local interest in Internet information about eNaira after it was launched by the central bank of Nigeria. However, the CN variable remained relatively high during the 40-week period, which suggests that the appetite for Internet information about cryptocurrency in Nigeria persisted even after the adoption of eNaira. In aggregate terms, the average EG variable is 18.85, and it is higher than the average EN variable at 16.32. This suggests that global interest in Internet information about eNaira was higher than local interest in Internet information about eNaira during the same period. Also, the average CN variable is 61.07 and is higher than the average CG at 37.35. This suggests that local interest in Internet information about cryptocurrency was higher than global interest in Internet information about cryptocurrency.

4. Empirical results

4.1 Local interest in eNaira versus cryptocurrency: comparing the Nigerian states

Figure 1 reports the interest over time for Internet information about eNaira and cryptocurrency by Nigerian residents or the interest over time for Internet information about eNaira and cryptocurrency emanating from Nigeria. This relates to the EG and EN variables. Regarding local interest in cryptocurrency (i.e. CN variable), Figure 1 shows that there was high local interest in cryptocurrency in south-east states such as Anambra, Ebonyi and Enugu during the period examined, while Zamfara state and the FCT had the lowest local interest in cryptocurrency during the period examined. The high local interest in cryptocurrency in Enugu, Ebonyi and Anambra states is due to the high number of active Internet users in these states and the high number of youths who are active Internet users in these states and who have strong desires to trade in cryptocurrency products and its derivatives to earn income or to preserve their wealth. Meanwhile, the very few local interest recorded in Zamfara state is due to the relatively low number of Internet users in Zamfara state and a general lack of interest in cryptocurrency among residents in Zamfara state. However, states such as Borno, Osun, Edo and Rivers recorded moderate interest in cryptocurrency during the period examined.

Regarding local interest in eNaira (i.e. the EN variable), Figure 1 shows that there was high local interest in information about eNaira in the core northern states, particularly in the north-west and north east states such as Yobe, Zamfara and Adamawa during the period examined, while south-east and south-south states such as Enugu, Akwa Ibom, Delta, Imo and Edo had the lowest local interest in information about eNaira during the period examined. The high local interest in eNaira in Yobe, Zamfara and Adamawa is due to the high dependence on government intervention for the smooth functioning of economic activities in these states. Its adoption, therefore, gave rise to the need to gain more information about the benefits of the government-led eNaira and how it would benefit them. Meanwhile, the low local interest in information about eNaira recorded in Enugu, Akwa Ibom, Delta, Imo and Edo states might be due to residents' preference to acquire information about cryptocurrency rather than acquiring information about eNaira. This might be due to the limited amount of Internet information provided about eNaira by the central bank, or might be due to a general lack of trust in government innovation by residents in those states since governments, historically,
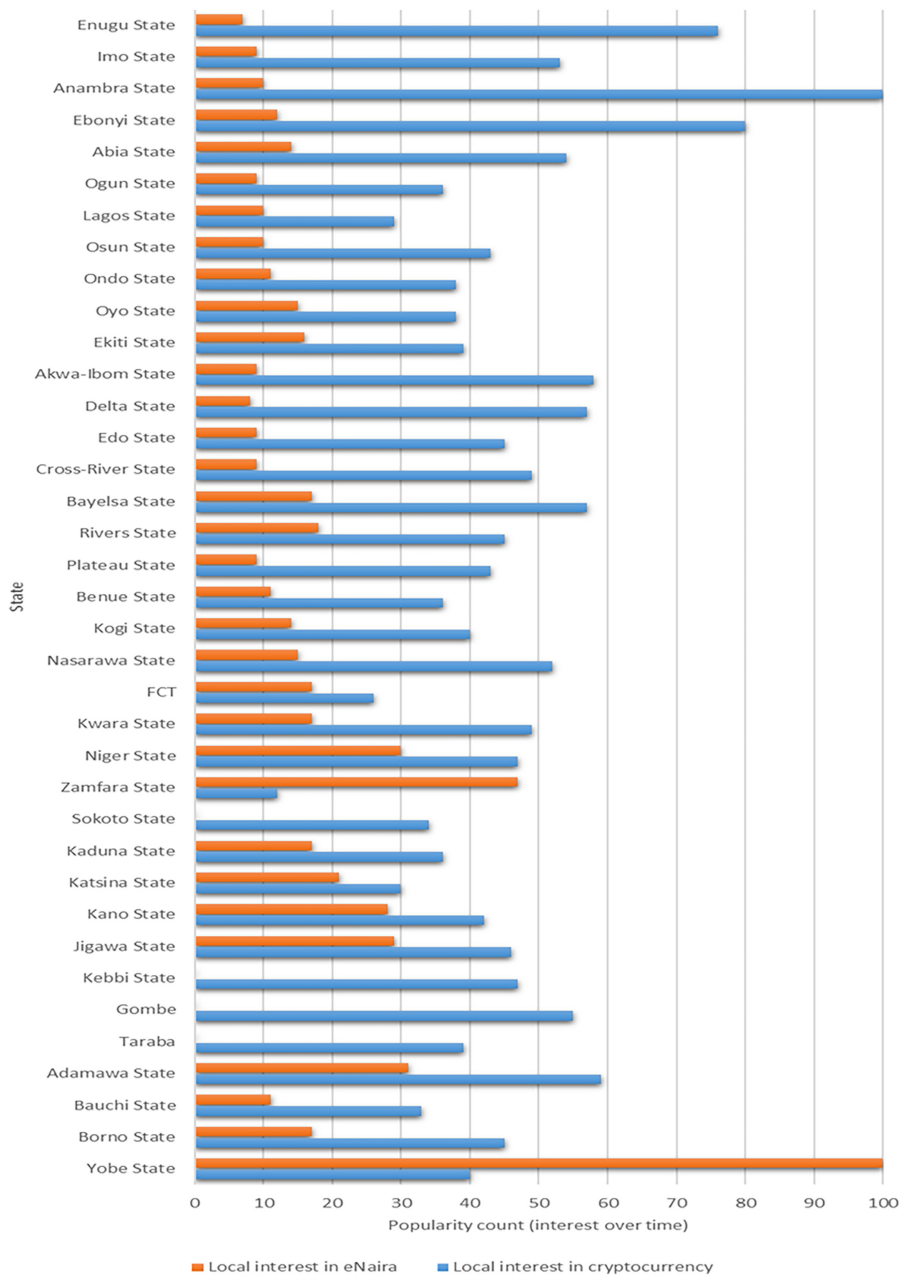
Source(s): Google Trends

do not spearhead innovation in financial services. However, some north-central states such as Kogi, Benue and Nasarawa recorded moderate interest in Internet information about eNaira during the period examined.

4.2 Local interest in eNaira and cryptocurrency: comparing the Nigeria geopolitical zones
The comparative analyses in this section are reported in Figure 2 and Table 2. In aggregate terms, Figure 2 shows that the south-east region had the highest interest in Internet information about cryptocurrency at 363 count during the period examined, followed by the south-south region at 311 count, the north-central region at 293 count, the north-east region at 271 count, the north-west region at 247 count and the south-west region at 223 count. Regarding interest in Internet information about eNaira, the north-east region had the highest interest in Internet information about eNaira at 159 count, followed by the north-west region at 142 count, the north-central region at 113 count, the south-west region at 71 count, the south-south region at 70 count and the south-east region at 52 count. A potential reason for the relatively high interest in Internet information about eNaira in the northern states is because of the excessive reliance on government intervention for the smooth functioning of economic activities in these states, which gives people in northern states a reason to search for the Internet to gain information about government products and services such as eNaira that can meet their needs and improve their welfare. Meanwhile, the potential reason for the relatively high interest in Internet information about cryptocurrency in the southern states is due to the high number of active Internet users there and the high number of youths who are active Internet users in these states and who have strong desires to trade in cryptocurrency products and its derivatives to earn income or to preserve their wealth.

I then proceed to assess the interest in Internet information about eNaira and cryptocurrency in each region or geopolitical zone. In the north-east region in Table 2, Adamawa state recorded the highest interest in Internet information about cryptocurrency during the period, while Taraba state had the lowest interest in Internet information about cryptocurrency. Gombe, Bauchi, Borno and Yobe states recorded some level of interest in Internet information about cryptocurrency during the period. Regarding interest in Internet
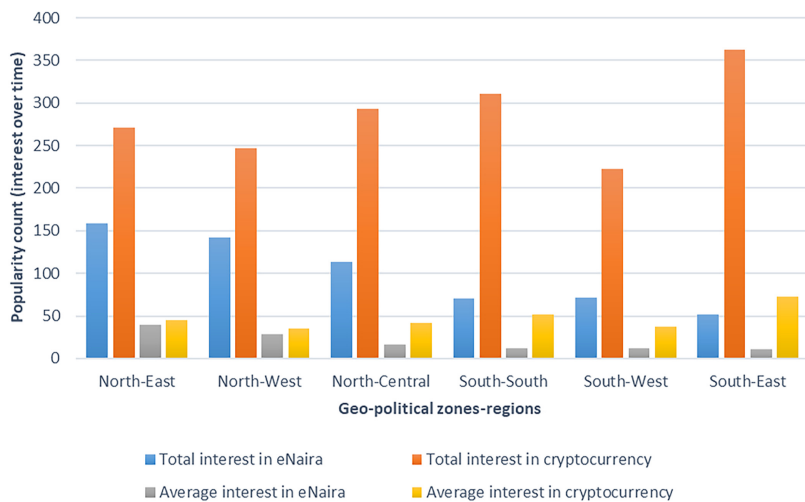

Figure 2.
Comparing interest in eNaira and cryptocurrency in the geopolitical zones

Source(s): Google Trends

Regions	Name of states	Crypto popularity count	eNaira popularity count
North-east	Yobe	40	100
	Borno	45	17
	Bauchi	33	11
	Adamawa	59	31
	Taraba	39	–
	Gombe	55	–
	Total	*271*	*159*
	Average	*45.2*	*39.8*
North-west	Kebbi	47	–
	Jigawa	46	29
	Kano	42	28
	Katsina	30	21
	Kaduna	36	17
	Sokoto	34	–
	Zamfara	12	47
	Total	*247*	*142*
	Average	*35.3*	*28.4*
North-central	Niger	47	30
	Kwara	49	17
	FCT	26	17
	Nasarawa	52	15
	Kogi	40	14
	Benue	36	11
	Plateau	43	9
	Total	*293*	*113*
	Average	*41.85*	*16.1*
South-south	Rivers	45	18
	Bayelsa	57	17
	Cross-River	49	9
	Edo	45	9
	Delta	57	8
	Akwa-Ibom	*58*	*9*
	Total	*311*	*70*
	Average	*51.83*	*11.7*
South-west	Ekiti	39	16
	Oyo	38	15
	Ondo	38	11
	Osun	43	10
	Lagos	29	10
	Ogun	36	9
	Total	*223*	*71*
	Average	*37.2*	*11.8*
South-east	Abia	54	14
	Ebonyi	80	12
	Anambra	100	10
	Imo	53	9
	Enugu	76	7
	Total	*363*	*52*
	Average	*72.6*	*10.4*

Source(s): Google Trends and author's computation

information about eNaira, Yobe and Adamawa states outperformed all other north-east
states in interest in Internet information about eNaira during the period, while Bauchi state
had the lowest interest in Internet information about eNaira in the region during the period.

In the north-west region, Kebbi and Jigawa states recorded the highest interest in Internet information about cryptocurrency during the period, while Zamfara state had the lowest interest in Internet information about cryptocurrency during the period. Kano, Katsina, Kaduna and Sokoto states recorded some level of interest in Internet information about cryptocurrency during the period. Regarding interest in Internet information about eNaira, Jigawa and Kano states outperformed all other north-west states in interest in Internet information about eNaira during the period, while Katsina state had the lowest interest in Internet information about eNaira in the region during the period.

In the north-central region, Nasarawa state recorded the highest interest in Internet information about cryptocurrency during the period, while Benue state had the lowest interest in Internet information about cryptocurrency during the period. Niger, FCT, Kogi, Plateau and Kwara states recorded some level of interest in Internet information about cryptocurrency during the period. Regarding interest in Internet information about eNaira, Niger state outperformed all other north-central states in interest in Internet information about eNaira during the period, while Plateau state had the lowest interest in Internet information about eNaira in the region during the period.

In the south-south region, Akwa Ibom state recorded the highest interest in Internet information about cryptocurrency during the period, while Edo state had the lowest interest in Internet information about cryptocurrency during the period. Rivers, Bayelsa, Cross-River and Delta states recorded some level of interest in Internet information about cryptocurrency during the period. Regarding interest in Internet information about eNaira, Rivers and Bayelsa states outperformed all other south-south states in interest in Internet information about eNaira during the period, while Delta state had the lowest interest in Internet information about eNaira in the region during the period.

In the south-west region, Osun state recorded the highest interest in Internet information about cryptocurrency during the period, while Lagos state had the lowest interest in Internet information about cryptocurrency during the period. Ekiti, Oyo, Ondo and Ogun states recorded some level of interest in Internet information about cryptocurrency during the period. Regarding interest in Internet information about eNaira, Ekiti and Oyo states outperformed all other south-west states in interest in Internet information about eNaira during the period, while Ogun state had the lowest interest in Internet information about eNaira in the region during the period.

In the south-east region, Anambra state recorded the highest interest in Internet information about cryptocurrency during the period, while Imo state had the lowest interest in Internet information about cryptocurrency during the period. Ebonyi, Abia and Enugu states recorded some level of interest in Internet information about cryptocurrency during the period. Regarding interest in Internet information about eNaira, Abia state outperformed all other south-south states in interest in Internet information about eNaira during the period, while Enugu state had the lowest interest in Internet information about eNaira in the region during the period.

4.3 Global interest in cryptocurrency: comparing countries
Figure 3 presents the global interest in cryptocurrency (CG) during the period examined. Figure 3 shows that Nigeria recorded the highest interest in Internet information about cryptocurrency as global interest in cryptocurrency exceeded the 50-point mark in Nigeria. Other countries that recorded a relatively high interest are the United Arab Emirates, Singapore and Kenya. This indicates that cryptocurrency was more popular in Nigeria, and also popular in the United Arab Emirates, Singapore and Kenya during the period. The high interest in Internet information about cryptocurrency in Nigeria is due to increase in the demand for income-generating opportunities in digital products that are not regulated by
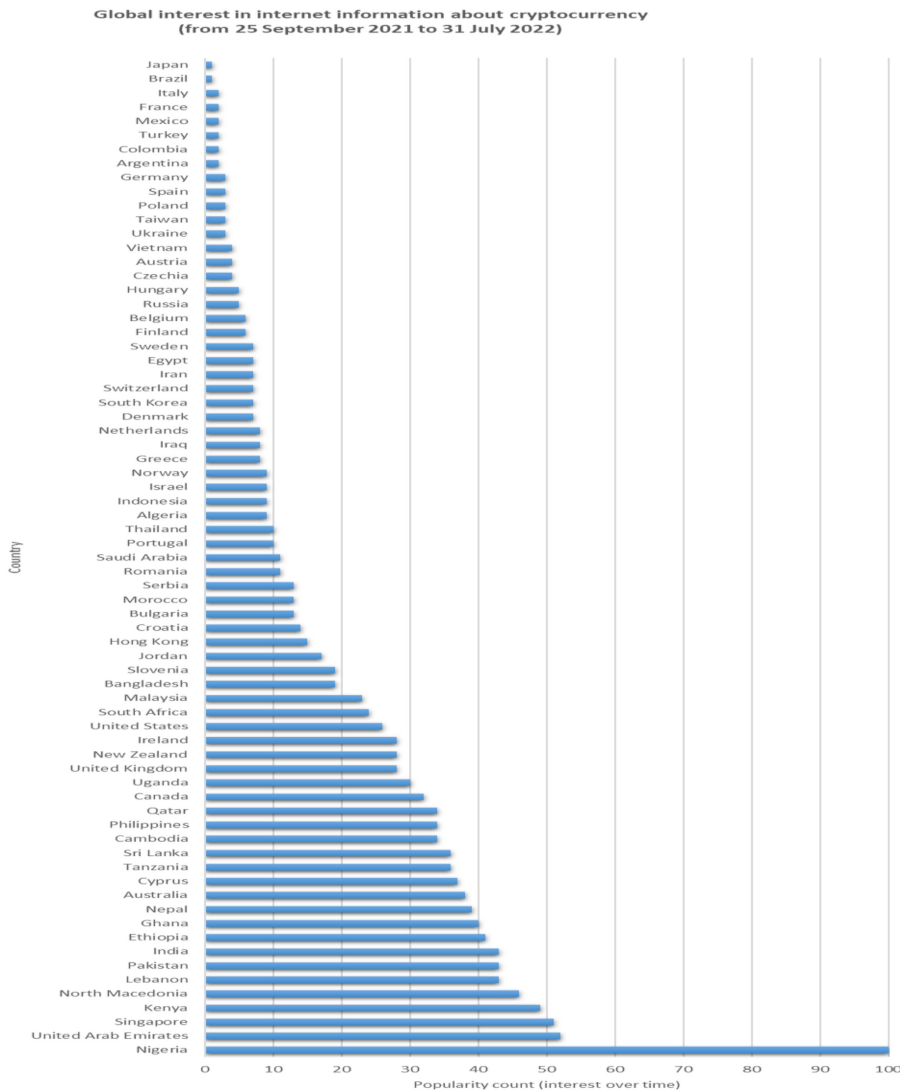
Global interest in internet information about cryptocurrency
(from 25 September 2021 to 31 July 2022)

Source(s): Google Trends

the government. As a result, a lot of people in Nigeria were seeking to gain more online information about cryptocurrency products. They want to learn about cryptocurrency, how it can help to improve their lives and how it can help to grow their wealth. In contrast, average interest in Internet information about cryptocurrency was recorded in the United States, Ireland, New Zealand and the United Kingdom, among others. The moderate interest in cryptocurrency in these countries is because there are many alternatives to cryptocurrencies in these countries; therefore, people are not **obsessed** about cryptocurrency in these countries. Meanwhile, global interest in cryptocurrency is very low in Japan and Brazil.

The reason for this is the general lack of interest in cryptocurrency among the population of the two countries.

4.4 Global interest in eNaira: comparing countries

Figure 4 presents the global interest in eNaira (EG) during the period examined. Figure 4 shows that Nigeria recorded the highest interest in Internet information about eNaira as global interest in eNaira exceeded the 50-point mark in Nigeria. Other countries that recorded some moderate interest are mostly African countries such as Benin, Togo and Gabon. This indicates that eNaira was more popular in Nigeria. The high interest in Internet information about eNaira in Nigeria is due to the need to gain online information and knowledge about the purpose, use and benefits of eNaira. In contrast, average interest in Internet information about eNaira was recorded in Gabon, Togo and Benin. Meanwhile, global interest in eNaira is very low in the United Arab Emirates. The reason for this is the general lack of interest in eNaira among the people of the UAE.

4.5 Correlation analysis

In the Pearson correlation analysis in Table 3, the EG variable is significant and positively correlated with the EN variable. The correlation coefficient is 0.97, as shown in Table 3. This suggests that global interest in Internet information about eNaira was strongly correlated with local interest in Internet information about eNaira. The CG variable is significant and positively correlated with the CN variable. The correlation coefficient is 0.718, as shown in Table 3. This suggests that global interest in Internet information about cryptocurrency was strongly correlated with local interest in Internet information about cryptocurrency. Also, the EG variable is significant and positively correlated with the CG variable. The correlation coefficient is 0.832, as shown in Table 3. This suggests that global interest in Internet information about eNaira was correlated with global interest in Internet information about cryptocurrency. Finally, the EG variable is significant and positively correlated with
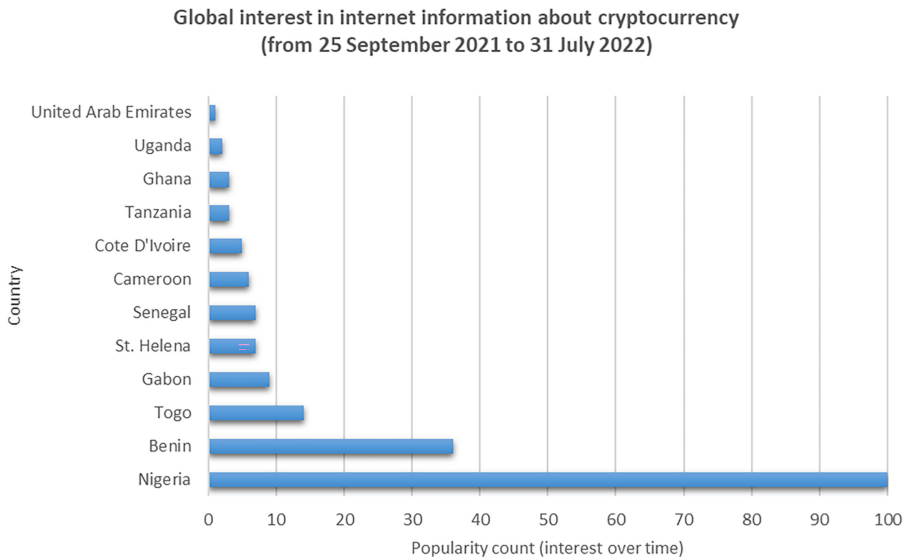
Figure 4.
Global interest in Internet information about eNaira (from September 25, 2021 to July 31, 2022)

Source(s): Google Trends

the CN variable. This suggests that global interest in Internet information about eNaira was correlated with local interest in Internet information about cryptocurrency.

4.6 Unit root and Granger causality test

In this section, I conduct a Granger causality test among the CG, EG, CN and EG variables. To conduct the Granger causality test, there is need to first check for the stationarity of the time series data using the augmented Dickey-Fuller (ADF) unit root test. The summary of the ADF unit root test for CG, CN, EG and EN variables is reported in Table 4. The purpose of conducting a unit root test is to test for the stationarity of the data. The ADF-Fisher chi-square test is reported in Table 4. The CG time series data has a p-value of 0.005, which is less than 0.05. This leads to the rejection of the null hypothesis that CG has a unit root; therefore, the CG data is stationary. The CN time series data has a p-value of 0.07, which is greater than 0.05. This leads to the acceptance of the null hypothesis that CN has a unit root; therefore, the CN data is nonstationary. The EG time series data has a p-value of 0.000, which is less than 0.05. This leads to the rejection of the null hypothesis that EG has a unit root; therefore, the EG data is stationary. The EN time series data has a p-value of 0.004, which is less than 0.05. This leads to the rejection of null hypothesis that the EN data has a unit root; therefore, the EG data is stationary. The ADF unit root test in Table 4 shows that the CN time series data is nonstationary. This means that the CN time series has to be first-differenced before conducting the Granger causality test.

The Granger causality test results are reported in Table 5. Table 5 shows that the CG variable Granger causes the EG variable. This is because the Granger causality test reports a

Variables	EG	EN	CN	CG	
EG	1.000				
	–				
EN	0.970***	1.000			
	(0.00)	–			
CN	0.544***	0.549***	1.000		
	(0.00)	(0.00)	–		
CG	0.832***	0.796***	0.718***	1.000	**Table 3.**
	(0.00)	(0.00)	(0.00)	–	Pearson correlation
Note(s): p-values are in parenthesis. *** denotes statistical significance at the 1% level					among the interest over
Source(s): Author's computation					time variables

Variable	t-statistic	p value	Decision rule (if $p > 0.5$, accept null hypothesis that the data has unit root and is non-stationary)	Remark	
CG	−3.92	0.0045	$p < 0.05$; reject null hypothesis. The data do not have a unit root	Data are therefore stationary	
EG	−6.90	0.000	$p < 0.05$; reject null hypothesis. The data do not have a unit root	Data are therefore stationary	
CN	−2.74	0.07	$p > 0.05$; accept null hypothesis. The data have unit root	Data are nonstationary	
EN	−3.97	0.004	$p < 0.05$; reject null hypothesis. The data do not have a unit root	Data are therefore stationary	**Table 4.** Augmented Dickey-Fuller unit root test
Source(s): Author's computation					(new search category)

Granger causality tests (period: 1993–2021; number of lags: 2)	F-statistic	*p*-value	Decision
d(CN) does not Granger cause CG	1.241	(*p* = 0.303)	No Granger causality
CG does not Granger cause *d*(CN)	2.271	(*p* = 0.119)	No Granger causality
EG does not Granger cause *CG*	2.773	(*p* = 0.077)	No Granger causality
CG does not Granger cause *EG*	3.965	(*p* = 0.028)	Has Granger causality
EN does not Granger cause *CG*	2.259	(*p* = 0.120)	No Granger causality
CG does not Granger cause *EN*	8.085	(*p* = 0.001)	Has Granger causality
EG does not Granger cause d(*CN*)	0.488	(*p* = 0.619)	No Granger causality
d(CN) does not Granger cause *EG*	4.126	(*p* = 0.026)	Has Granger causality
EN does not Granger cause d(*CN*)	4.554	(*p* = 0.018)	Has Granger causality
d(CN) does not Granger cause *EN*	3.169	(*p* = 0.06)	Has Granger causality
EN does not Granger cause EG	1.766	(*p* = 0.187)	No Granger causality
EG does not Granger cause EN	1.737	(*p* = 0.192)	No Granger causality

Note(s): *d*(.) means first-differenced
Source(s): Author's computation

Table 5.
Pairwise Granger
causality test

p-value of 0.028, which is less than 0.05. This leads to the rejection of the null hypothesis and acceptance of the alternative hypothesis that the CG variable Granger causes the EG variable. Similarly, the CG variable Granger causes the EN variable. This is because the causality between CG and EN reports a *p*-value of 0.001, which is less than 0.05. This leads to the rejection of the null hypothesis and the acceptance of the alternative hypothesis that the CG variable Granger causes the EN variable. Also, the CN variable Granger causes the EG variable. This is because the Granger causality test reports a *p*-value of 0.026, which is less than 0.05. This leads to the rejection of the null hypothesis and the acceptance of the alternative hypothesis that the CN variable Granger causes the EG variable. Overall, the results show that there is a one-way or uni-directional causality running from the CG variable to the EG variable, from the CG variable to the EN variable, and from the CN variable to the EG variable. The one-way causality running from the CG variable to the EG variable indicates that global interest in cryptocurrency causes global interest in eNaira. The one-way causality running from the CG variable to the EN variable indicates that global interest in cryptocurrency causes local interest in eNaira among Nigerian Internet users. Also, the one-way causality running from the CN variable to the EG variable indicates that local interest in cryptocurrency causes global interest in eNaira.

4.7 GMM regression coefficient matrix
In this section, the Arellano and Bond (1991) first-difference generalized method of moments (GMM) regression coefficient matrix was used to determine the empirical relationship between CG, CN, EG and EN, as shown in Table 6. I focus on the sign and statistical significance of the coefficient of the variables in the univariate GMM regression model. The purpose of the estimation is to check whether the coefficients of the variables in the estimations confirm the correlation and causality test in Tables 3 and 5. To do this, I specify one dependent variable and one independent variable regression model, as shown in Table 6. The result in Table 6 shows that the coefficients are all positive and statistically significant in all the models. This indicates that the CG, CN, EG and EN variables are all positive and significantly associated with each other in the GMM estimations in Table 6. This results confirm the Granger causality result between the CG and EG variables, the CG and EN variables, and CN and EG variables. The results also confirm the positive correlation among the variables in the correlation analysis in Table 3.

	(1) Global interest in cryptocurrency (CG) Coefficient (*t*-statistic)	(2) Local interest in cryptocurrency (CN) Coefficient (*t*-statistic)	(3) Global interest in eNaira (EG) Coefficient (*t*-statistic)	(4) Local interest in eNaira (EN) Coefficient (*t*-statistic)
Global interest in cryptocurrency (CG)	–	1.666*** (11.17)	0.442*** (7.96)	0.362*** (6.50)
Local interest in cryptocurrency (CN)	0.539*** (11.41)	–	0.229*** (5.09)	0.191*** (4.34)
Global interest in eNaira (EG)	2.102*** (8.97)	3.761*** (5.97)	–	0.862*** (21.82)
Local interest in eNaira (EN)	2.402*** (7.46)	4.413*** (5.22)	1.141*** (23.04)	–

Note(s): **** represent statistical significance at the 1% level
Source(s): Author's computation

Table 6.
GMM regression
coefficient matrix

4.8 Implications for financial stability

The analysis in this paper showed that the introduction of eNaira did not decrease the appetite for cryptocurrency information in Nigeria. Notwithstanding, there is growing interest in eNaira information. It has benefits that cryptocurrencies do not offer. It provides a safe and trusted digital currency that has the full guarantee and backing of the government. The Nigerian central bank digital currency, also known as eNaira, is designed to offer payment solutions at least for now. Although eNaira would further complement the Nigerian monetary system, it has restricted use as a tool for monetary policy. However, its use as an alternative payment solution has implications for financial stability since the activities in the payment system have a direct effect on the stability of the financial system. Introducing eNaira in the unique Nigerian economic system would give rise to known risks and new risks.

One of such risks is the risk of bank runs. This is an important risk because, in the future, eNaira would enable Nigerian citizens to convert their bank deposits into central bank money within seconds in the event of banking crisis tensions in the Nigerian financial system. In extreme cases, this could lead to the collapse of some Nigerian banks if they encounter liquidity problems due to deposit migration from bank deposits to CBDC deposits. The presence of deposit insurance may not be able to avert a digital bank run. For this reason, bank regulators and supervisors in Nigeria – the Central Bank and the Nigeria Deposit Insurance Corporation – need to be very vigilant in protecting against bank runs. They should identify and control risks at an early stage. Regulators can reduce the risk of bank runs through the design of eNaira. Another risk arises from structural disintermediation when bank customers migrate a significant proportion of their bank deposits to CBDC or eNaira deposits. The consequence is that commercial banks would lose cheap and stable source of funding, thereby increasing the cost of funding for commercial banks. This could lead to a fall in banks' credit supply and could worsen financing conditions for the real economy in Nigeria.

Despite these risks, eNaira has some value. In fact, its advantages are more than its perceived risks. For instance, eNaira would safeguard the anchoring function of central bank money in an increasingly digitalized world. It would allow private commercial bank money to be easily exchanged for central bank money in the digital economy. It can also support payments and increase Nigeria's payment sovereignty. With eNaira, future digital payments in Nigeria can be carried out independently of foreign payment infrastructures. This would reduce risks and dependencies in payment transactions, which would also be beneficial to financial stability in Nigeria.

5. Conclusion

This paper examined the global and local interest in Internet information about cryptocurrency and the Nigeria central bank digital currency also known as eNaira. The findings revealed that there was sustained increase in global and local interest in Internet information about eNaira in the first six weeks after its adoption. Local interest in Internet information about cryptocurrency in Nigeria exceeded global interest in Internet information about cryptocurrency. The south-east region had the highest interest in cryptocurrency information followed by the south-south, the north-central, the north-east, the north-west and the south-west regions. In contrast, the north-east region had the highest interest in Internet information about eNaira followed by the north-west, the north-central, the south-west, the south-south and the south-east regions. Nigeria recorded the highest global interest in Internet information about cryptocurrency and eNaira, while Japan and Brazil recorded the lowest interest during the period. The correlation results showed a significant and positive correlation between interest in cryptocurrency information and interest in eNaira information. The Granger causality results show that global interest in cryptocurrency information causes both global interest in eNaira information and local interest in eNaira information. Also, local interest in cryptocurrency information causes global interest in eNaira information. The GMM regression coefficient matrix showed a significant positive relationship between interest in cryptocurrency information and eNaira information. The general implication of the findings is that people who were interested in Internet information about eNaira were also interested in Internet information about cryptocurrencies. There is a need to increase the amount of Internet information about eNaira, thereby making it easier for people to embrace it in their daily lives. Private sector agents and policy makers should use incentives to encourage people to develop interest in eNaira. Policy makers should also create a policy environment that make it easier for people to adopt eNaira despite the growing interest in cryptocurrency information. Future studies can extend this study by investigating whether interest in eNaira is correlated with interest in the CBDC of other countries. Future studies can also examine the relationship between interest in CBDC in specific country contexts.

Note

1. See Ozili (2022c) for a detailed breakdown of the structure of eNaira. The structure of eNaira is not the focus of this paper.

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