Impact of Digital Currency on Deposit Money Bank in Nigeria

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ABSTRACT

This study investigates the impact of digital currency on deposit money banks in Nigeria from 2010 to 2023. Employing a quantitative approach, the study utilizes econometric analysis, specifically the Ordinary Least Squares (OLS) method, to examine the relationship between digital currency transactions, money supply, interest rates, and deposit money bank performance. The study addresses the stationarity of time series variables through unit root tests and employs the Johansen cointegration test to determine long-term equilibrium relationships. The Error Correction Mechanism (ECM) model is then estimated to analyse the dynamic adjustment process. The findings reveal a significant negative impact of digital currency transactions on deposit money, while money supply and interest rates exhibit positive correlations. The study concludes with policy recommendations for navigating the evolving landscape of digital finance in Nigeria.

Keywords: Digital Currency, Deposit Money Banks and Ordinary Least Squares (OLS)

INTRODUCTION

The advent of digital currencies has significantly transformed the global financial landscape, introducing both opportunities and challenges for traditional banking institutions. In Nigeria, the Central Bank of Nigeria (CBN) launched the naira in October 2021, positioning it as Africa's first central bank digital currency (CBDC) (Central Bank of Nigeria, 2021). This initiative aims to enhance financial inclusion, improve payment systems, and reduce the costs associated with physical cash management. However, the integration of digital currencies like the naira into Nigeria's financial ecosystem has profound implications for deposit money banks (DMBs), necessitating a comprehensive examination of their impact on traditional banking operations (El-Yaqub, Usman, Musa & Ismail, 2024).

One of the primary concerns regarding the adoption of digital currencies is the potential disintermediation of traditional banks. As customers transition to using digital wallets provided by the central bank, there is a risk that deposits may migrate from commercial banks to the eNaira platform. This shift could diminish the deposit base of DMBs, subsequently affecting their liquidity positions and their ability to extend credit (International Monetary Fund, 2021). Such a development poses significant challenges to the traditional banking model, which relies heavily on deposit mobilization for lending activities (El-Yaqub, 2024).

Conversely, the introduction of the eNaira presents opportunities for DMBs to innovate and enhance their service offerings. By integrating digital currency functionalities into their platforms, banks can offer seamless and efficient payment solutions, attracting a broader customer base. Moreover, the naira's potential to reduce transaction costs and improve payment efficiency aligns with the banks' objectives of enhancing customer satisfaction and operational efficiency (Central Bank of Nigeria, 2021). Therefore, strategic collaboration with the CBN in promoting and utilizing the eNaira could position DMBs to leverage the benefits of digital currency adoption.

However, the implementation of digital currencies also introduces risks related to cybersecurity and operational resilience (El-Yaqub, Ismail, Bappayo, 2024). The digital nature of the eNaira necessitates robust cybersecurity measures to protect against potential threats that could compromise the integrity of the financial system. Additionally, banks must invest in technological infrastructure and employee training to effectively manage and support digital currency transactions (International Monetary Fund, 2021). Failure to address these challenges could undermine public confidence in both the digital currency and the banking institutions facilitating its use (Ismail, Musa, & Magaji, 2024).

The impact of digital currencies, particularly the eNaira, on deposit money banks in Nigeria is multifaceted, encompassing both challenges and opportunities. While there are concerns about potential disintermediation and cybersecurity risks, there are also prospects for innovation, improved payment systems, and enhanced financial inclusion. The extent to which DMBs can adapt to this evolving financial landscape will determine their relevance and competitiveness in Nigeria's digital economy. Therefore, a proactive approach that embraces technological advancements while mitigating associated risks is essential for the sustainable integration of digital currencies into Nigeria's banking sector.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Conceptual Review

Digital Currency

Digital currency refers to a type of currency available only in digital or electronic form, rather than in physical formats like coins or banknotes. It includes cryptocurrencies like Bitcoin and Ethereum, as well as central bank digital currencies (CBDCs) issued by governments. Digital currencies offer benefits such as fast and borderless transactions, reduced transaction costs, and enhanced transparency through blockchain or other distributed ledger technologies. However, they also present challenges, including regulatory concerns, cybersecurity risks, and potential impacts on monetary policy. As the global economy increasingly adopts digital solutions, digital currencies are becoming a crucial element of financial innovation and inclusion (Nakamoto, 2008; International Monetary Fund [IMF], 2021).

Deposit Money Banks

Deposit money banks (DMBs) are financial institutions authorized to accept deposits from the public and provide various financial services, including loans, credit facilities, and payment systems. They play a pivotal role in the financial system by mobilizing savings and channeling them into productive investments, thus fostering economic growth. DMBs also facilitate monetary policy implementation by central banks, acting as intermediaries in the transmission of policy decisions. Through offering services such as checking and savings accounts, DMBs ensure liquidity management and payment system efficiency. However, their operations are subject to regulatory frameworks to safeguard depositors' funds and maintain systemic stability (El-Yaqub, Ismail & Eke, 2024; Mishkin, 2021; Saunders & Cornett, 2019).

Theoretical Review

Financial Innovation Theory

Financial Innovation Theory explores the processes and impacts of creating new financial instruments, technologies, or services that improve efficiency, accessibility, and functionality within financial markets. Proposed by economists like Silber (1983), the theory argues that financial innovation arises in response to constraints and inefficiencies within existing systems, such as regulatory limitations, economic crises, or technological advancements. Innovations like ATMs, credit default swaps, blockchain technology, and mobile banking have transformed the financial landscape by enabling faster transactions, reducing costs, and enhancing access to financial services. These developments contribute to economic growth by promoting liquidity and enabling more effective risk management (Silber, 1983; Frame & White, 2004).

However, while financial innovation often brings positive change, it also introduces challenges, including increased complexity, regulatory gaps, and systemic risks. For example, the global financial crisis of 2008 highlighted the dangers of certain financial innovations, such as mortgage-backed securities, which amplified risks in the financial system. Critics argue that unchecked financial innovation can lead to unintended consequences, requiring robust regulatory frameworks to mitigate associated risks. Despite these challenges, Financial Innovation Theory underscores the importance of fostering innovation in a controlled environment to maximize its benefits while minimizing potential downsides (Tufano, 2003; Merton, 1992).

Empirical Review

Obiora, Omaliko, and Okeke (2022) investigated the connection between the financial performance of Nigerian

listed deposit money institutions and the E-Naira digital currency. First Bank, Zenith Bank, Access Bank, UBA, Union Bank, GTBank, Fidelity Bank, FCMB, and First Bank are among the banks in Awka Metropolis whose employees were given questionnaires as part of the study's survey design. Kendall's Coefficient of Concordance was used for data analysis, and the model was defined with a hypothesis. At a 1% significance level, the results demonstrated a positive and substantial correlation between the E-Naira and the banks' financial performance. According to the study's findings, implementing Central Bank Digital Currency (CBDC) may boost income production, lower cash processing expenses, and increase the usage of central bank currency.

In research titled "The Effects of Digital Currency (eNaira) Adoption on Nigeria's Economy," Adegbite and Aremu (2022) looked at the factors that influence eNaira adoption and how it affects the Nigerian economy. Using a random sample technique, the study collected data from 2,583 respondents—including bank employees, economists, and Nigerians—distributed via Google Forms via email and WhatsApp across the six geopolitical zones. The dependent variable in the model was the adoption of digital money, whereas the independent variables were policymakers, human behavior, ICT, personnel, and education. ANOVA, Chi-square, MANOVA, and correlation methods were used to evaluate the data. The results of MANOVA showed that the adoption of eNaira in Nigeria is significantly influenced by human behavior, government policy, education, blockchain, and personnel. Adoption of eNaira was also shown to have a favorable and noteworthy impact on the Nigerian economy. According to the report, the Central Bank of Nigeria (CBN) should put in place validation procedures to stop identity theft and duplicate spending, and it should also support public education initiatives to inform the public about the distinctions between eNaira and digital representations of cash deposits.

El-Yaqub, Ismail and Eke (2024) analyze the impact of commercial bank credit on small and medium scale enterprise in Nigeria: 1992 to 2022 using Autoregressive Distributed Lag model (ARDL). The stationarity results showed that SMEs profit (SMEP) and Lending rate (LENR) were integrated at levels I(0) while commercial bank credit to SMEs (CLSME) and money supply (TMS) were stationary after the first different. The result of the ARDL Bound test showed that long-run relationships are thus evident between the variables. Furthermore, the result demonstrates that the adjustment mechanism (ECMt-1) is statistically significant and has the necessary sign (negative). Showing that a short-term shock will eventually be brought to equilibrium at an average pace of 95% annually. The ARDL results showed that CLSME has a negative and a positive significant impact on SMEP in the short run and the long run, respectively. LENR has a positive significant and insignificant impact on SMEP in the short run and long run, respectively. Finally, TMS has a positive and a negative significant impact on SMEP in short run and the long run, respectively. The study concluded that commercial bank credit has impact on small and medium scale enterprise (SMEs) in Nigeria. Hence, the study recommended that commercial banks should prioritize lending to small and medium scale in Nigeria with a view to achieve rapid growth among SMEs in Nigeria, and government through monetary policy authority should reduce lending rate that will be profitable to small and medium enterprise with intention for business expansion and creation of jobs in the country.

Ogbuji, & Lawal, (2024) examine the crucial roles of deposit money banks (DMBs) in driving economic growth in Nigeria. The study uses various banking metrics and performance indicators such as Loan to Deposit Ratio (LTD), Credit to the Private Sector (CPS), Liquidity Ratio (LR), Cash Reserve Ratio (CRR), Inflation Rate (INF), Interest Rate (INT), and Monetary Policy Rate (MPR) and the growth rate of Gross domestic product (GGR). Time series data from the CBN statistical bulletin spanning the period of 2008 to 2022 were used and. the Ordinary Least Squares (OLS) regression model was employed to analyze the data gathered. The findings of the study revealed that LTD positively and significantly contributed to economic growth in Nigeria while CPS, INF and INT exhibit a negative impact on growth in Nigeria. However, MPR has positive but insignificant impact on growth. Furthermore, LR and CRR were found to constrain the lending capacity of banks, thereby hindering growth in Nigeria. The study thus recommends that monetary policy frameworks of the CBN be reviewed to reduce reserve requirement of DMBs and that more growth inducing credit risk assessment policies of the CBN be implemented. Based on the banking sector performance parameters used in the study, the study therefore concludes that the roles of DMBs in Nigeria have not had the expected positive impact on growth in the economy, although their impact are significant, since only two out of seven of the parameters used had positive impact on economic growth in Nigeria.

El-Yaqub, Musa and Ismail (2024) investigate the effects of monetary policy on economic growth in Nigeria from 1986-2021 using autoregressive distributed lag (ARDL) as methodology. Findings from the study indicate thatthe monetary policy's short- and long-term effects on Nigeria's economic growth were estimated using

Autoregressive Distributed Lag (ARDL) bound co-integration, which revealed a long-term association. Additional estimation results indicated that Nigeria's economic growth was impacted by monetary policy. The Vector Error Correction Model (VECM) result indicates that LM2 and LEXC have a little greater effect on GDP growth in a shorter amount of time than LBCP and INT. Similarly, over a longer period, LM2 and LEXC have a much greater impact on GDP growth than INT and LBCP. The examination of the results indicated that the monetary policy measures implemented by the Central Bank of Nigeria had a noteworthy effect on the economic growth of the country. Thus, it is advised that the Central Bank of Nigeria lift the limitations on lending to the private sector, which can support an economy. By promoting the creation of interest rate and currency rate regimes that are based on the market, monetary policies should be used to promote investment from both domestic and international sources.

Gaps in the Literature

A significant research gap emerges from the existing literature regarding the integration of Central Bank Digital Currencies (CBDCs), specifically the eNaira, within broader economic frameworks, such as the role of monetary policies, banking sector performance, and their collective impact on financial inclusion and economic growth in Nigeria. While studies, such as Obiora et al. (2022) and Adegbite & Aremu (2022), demonstrate the positive impact of eNaira on financial performance and the economy, there is limited research exploring the interaction between digital currency adoption, commercial bank policies, and long-term economic development. Additionally, although research by El-Yaqub et al. (2024) and Ouija & Lawal (2024) touches on the influence of banking metrics and monetary policies on economic growth, the potential synergy between CBDCs, commercial bank lending behaviours, and SME development remains unexplored. This gap highlights the need for a comprehensive study that investigates how the eNaira, in conjunction with banking sector dynamics and monetary policies, can foster sustainable economic growth, particularly for SMEs, while ensuring financial inclusion and addressing challenges such as digital literacy and cyber security.

METHODOLOGY

Research Design

This study examines the effect of digital currency on deposit money in Nigeria from 2010 to 2023 utilizing a quantitative research approach and econometric analysis. The data is analyzed using the Ordinary Least Squares (OLS) estimation approach. Because of its Best Linear Unbiased Estimator (BLUE) characteristics, which guarantee effective and objective findings, OLS was chosen (Gujarati & Porter, 2009).

It is safe to do pre-diagnosis tests, such the unit root test, to determine the underlying characteristics of the time series variables in the model before estimating the model. Because figuring out a model in which there are of non-stationary time series variables typically results in spurious (meaningless) regression output with biased and incoherent estimates of the standard errors of the coefficients, unit root testing is crucial. If the right technique is not used to solve the issue, this could lead to misleading inference (Gujarati and Porter, 2009).

Diagnostic measures such the Durbin-Watson (d) statistic, adjusted R2, F-statistic, coefficient of multiple determinations (R2), and t-statistics were used to assess the estimated model. We may determine the robustness, dependability, and healthiness of the estimated model with the use of this collection of data. Additionally, the parameters of the designated linear econometric models were estimated using the ordinary least squares (OLS) estimation approach.

Model Specification

The following model was used by Ugwuanyi, Okon, and Anene (2020), who used Ordinary Least Square Analysis to examine the effects of digital finance on money in Nigeria between 2009 and 2018.

f(M2, ATM, POS) = GDP In other words... (3.1)

In which GDP stands for gross domestic product

Automated Teller Machine (ATM)

POS stands for Point of Sale and Payment System.

The aforementioned model by Ugwuanyi, Okon, and Anene (2020) was adapted as follows in order to accomplish the goal of this study:

Log (DCT, M2, RAST, and INTR) = DMB …… (3.2)

Because they are pertinent to the goals of the research, it was decided to alter the original model and include additional variables such Digital Currency Transactions (DCT), Money Supply (M2), and Interest Rate (INTR). Digital Currency Transactions (DCT) are important because they show how digital technologies like eNaira have a direct effect on the banking industry. Because it represents the total amount of liquidity in the economy, which affects money bank deposit levels, the money supply (M2) is included. Lastly, the interest rate (INTR) is a crucial component as it influences the cost of borrowing and saving, two things that are closely related to bank deposit mobilization efforts. With a more thorough understanding of the relationships between digital currencies and conventional banking practices, these factors give a more reliable model for analyzing how digital currencies may affect Nigerian deposit money institutions between 2010 and 2023.

DMB is calculated as follows: a0 + b1 log (DCT) + b2 log(M2) + b3 log (INTR) + μ(3.3).

Where:

Deposit Money Bank, or DMB

Digital Currency Transactions (DCT)

M2 = Money Supply

INTR = Interest Rate Log = Variable Logging.

an o - Partial Slopes Intercept Term b1, b2

μ stands for Error Term t.

The influence of digital currency on deposit money in Nigeria from 2010 to 2023 will be investigated using the given model. Digital currency transactions, money supply, return on assets, and interest rate were the independent variables that were used to assess Deposit Money Bank, the dependent variable.

Elements Evaluation and Conversation

The given model yields the linear equation that follows:

The following metrics are used to assess the economic variables in this study: The entire number of deposits held by financial institutions, expressed in Nigerian Naira (₦), is known as Deposit Money Bank (DMB). The value of digital transactions is represented by Digital Currency Transactions (DCT), which are also in ₦. The whole amount of liquidity in the economy is measured by the money supply (M2), in ₦. The interest rate, or INTR, is a percentage that represents the cost of borrowing money or saving it. If present, Real Asset (RAST) calculates the worth of material assets in ₦. The Central Bank of Nigeria (CBN) bulletins are the source of these statistics.

DMB is (3.4) equal to a0 + b1 log (DCT) + b2 log(M2) + b3 log (INTR) + μ.

U1 is the error term, while b0, b1, and b2 are the parameters that need to be estimated. According to economic theory, there should be a positive or negative correlation between the independent factors (interest rate, money supply, return on assets, and digital currency transactions) and the dependent variable (Deposit Money Bank). The following is a mathematical expression for these a priori expectations:

<0 or >0 0

Data Types and Sources

The primary source of secondary data for this research would be the Central Bank of Nigeria (CBN) Statistical Bulletin (2023). A trustworthy and thorough source of current and historical information on a range of Nigerian economic and financial indicators is the CBN Bulletin. These include financial data like deposit money bank (DMB) transactions as well as macroeconomic indicators like interest rates (INTR) and the money supply (M2).

Methods and Approaches for Evaluation

The ordinary least squares (OLS) approach is used to estimate the model mentioned above. Four factors led to the OLS method's acceptance in this investigation. First, the OLS method's parameter estimations have a set of ideal (desirable) characteristics known as BLUE qualities. Second, compared to other econometric methods, the OLS method's computing process is quite straightforward. Thirdly, a variety of economic relationships have made use of the least squares approach. Finally, the OLS method's mechanics are easy to comprehend. Because of its beneficial qualities (the BLUE properties), the OLS method estimate methodology is simply chosen. B stands for Best, L for Linear, U for Unbiased, and E for Estimators in this context.

The Econometric Views E-Views 9 software program is the study's analytical tool. Numerous diagnostic and summary statistics, including t-statistics, the coefficient of multiple determinations (R2), modified R2, the F-statistic, and the Durbin-Watson (d) statistic, were used to assess the reliability of the regression results. The definitions of these test statistics are given below.

Multiple Determination Coefficient (R2)

This is the correlation coefficient (R) squared. It calculates the percentage change in the dependent variable's value that may be anticipated based on changes in the independent variables' values. It is the most often used metric for evaluating how well the regression line fits data. Since its value falls between 0 and 1, or $0<R2<1$, it cannot be negative; a value of 1 indicates a complete goodness of fit, while a value of 0 indicates no fit at all.

R-squared adjusted

The quantity of degrees of freedom used up in estimating the regression model is taken into account or taken care of by adjusting the coefficient of determination. The symbolically defined adjusted R-square is one whose value falls between 0 and 1, or $0<<1$. A value of 1 indicates a complete goodness of fit, while a value of 0 indicates no fit at all.

The F-Test

This sums up the model's overall importance. It is used to assess a model's goodness of fit. The null hypothesis (H0) that the model's parameters are jointly significant and sufficient for forecasting and policy analysis is rejected if $F\text{-cal}>F0.05$; if $F\text{-cal}<F0.05$, the alternative hypothesis (H1) is rejected.

The t-test for statistics

The individual significance of a regression model's parameters is examined using the t-statistic. The alternative hypothesis (H1) is rejected if the t-ratio is less than t-critical, while the null hypothesis (H0) is rejected if the t-ratio is larger than t-critical.

The D-W (Durbin-Watson) statistic

The degree of first-order autocorrelation is tested using the D-W statistic. Its value is in the range of 0 and 4. Perfect positive autocorrelation is indicated if D-W=0, while perfect negative autocorrelation is shown if D-W=4. The following is the hypothesis for the D-W statistic test of autocorrelation:

H0: First-order autocorrelation does not exist.

H1: First-order autocorrelation is present.

Initial examinations

Before moving on to a more thorough analysis, preliminary checks are the first actions done in the early phases of a research or analysis process to guarantee the appropriateness, quality, and integrity of the data and methodology. These checks are necessary to find any possible problems, irregularities, or difficulties with the quality of the data that could affect the precision and dependability of the study's findings and conclusions.

Characteristic Statistics

Descriptive statistics are a very useful estimation technique for studying economic development and taxes. By statistically summarizing and describing important portions of your information, this approach offers a basic understanding of the relationship between taxes and economic growth. By calculating metrics such as mean, median, standard deviation, and range, you may get a better understanding of both variables' central tendency and dispersion.

Descriptive statistics may reveal periods of stability or volatility by identifying trends and patterns in economic growth and exchange rate fluctuations. Furthermore, the evaluation of skewness and kurtosis may reveal tail tendencies and asymmetries, suggesting possible non-linear interactions between the variables.

Analysis of Correlation

An essential estimate method for examining how exchange rates affect Nigeria's economic development is correlation analysis. This method measures how strongly and in which direction two variables—in this example, taxes and economic growth—have a linear connection. We can determine if there is a statistical relationship between changes in economic growth and exchange rate volatility by computing correlation coefficients. An adverse link would be shown by a negative correlation, while a positive correlation would imply that times of economic growth coincide with periods of currency appreciation.

Graphical analysis and line plots

You may get important insights into temporal trends and patterns by using graphical analysis and line plots as estimate approaches in your investigation of how exchange rates affect Nigeria's economic development. By using these methods, the data is graphically represented, making it easier to grasp how taxes and economic development are related.

For instance, line graphs show possible trends, cycles, and oscillations in the evolution of economic development and taxes throughout time. You may visually investigate whether specific exchange rate fluctuations correspond with shifts in economic development by charting both variables on the same graph. This might assist you in locating possible leads for more research.

Finding any outliers, abnormalities, or sudden changes in the data is another benefit of graphic analysis. Such events may indicate times of economic instability or external shocks that impacted both taxes and economic development, which might have significant ramifications for your research.

Test of the Unit Root

When evaluating the stationarity of time series data, the estimate method of unit root tests is important. Because non-stationary data might provide erroneous regression findings and possibly misleading conclusions, unit root testing are crucial.

Tests for unit roots, such the Phillips-Perron (PP) or Augmented Dickey-Fuller (ADF) tests, determine if a variable shows a unit root, a symptom of non-stationarity. In regression analysis, non-stationarity suggests that the data's statistical characteristics fluctuate with time, making it difficult to find significant correlations.

The Granger test of causation

A systematic way to evaluate possible causal links between these variables is to use the Granger Causality test

as an estimating methodology. The premise behind this test is that if one variable Granger-causes another, then the causing variable's historical values provide predictive information that goes beyond the caused variable's history. The Granger Causality test seeks to ascertain whether changes in exchange rates can be regarded as predictors of subsequent changes in economic growth, and vice versa, by putting historical time series data on taxation and economic growth through regression analyses that incorporate lagged values of both variables.

Thus, the Granger Causality test is a useful instrument for identifying dynamic relationships between taxes and economic development, which helps to clarify the intricate interactions between these variables in the Nigerian economic environment. On top of Form 3.5.3 Least Squares Ordinary (OLS)

To estimate the parameters of the provided model, the Ordinary Least Squares (OLS) estimation technique is used. The OLS was selected as the estimation technique because to its BLUE properties, which are beneficial aspects of its estimate. These qualities ensure competent inference-making, correct conclusion-drawing, and recommendation-making. Because it is one of the best estimation methods for linear economic models, the OLS was selected.

To perform the OLS, estimate of the given model, Econometric Views (E-views) were used. The estimated model is evaluated using diagnostic and summary statistics such as the Durbin-Watson (d) statistic, modified R2, F-statistic, t-statistic, and coefficient of multiple determination (R2). We can assess the reliability and robustness of the predicted model thanks to this data gathering.

DATA PRESENTATION AND ANALYSIS

Data Presentation

All of the tests mentioned in the previous chapter served as the basis for the results that are shown in this chapt er. Every result used for analysis in this chapter was gathered using the statistical software tools included in eV iews 9.0 and is shown in the appendix.

Data Analysis

Summary Statistics and Trend Analysis

Table 4.1 Summary Statistics

	DMB	DCT	M2	INR
Mean	20458.01	1269.484	20458.01	14.83214
Median	18948.95	641.9950	18948.95	16.25000
Maximum	40000.30	3567.230	40000.30	17.00000
Minimum	9456.700	256.4500	9456.700	6.130000
Std. Dev.	8531.125	1169.192	8531.125	2.997992
Skewness	1.054275	0.961643	1.054275	-1.931250
Kurtosis	3.429249	2.340861	3.429249	6.105550
Jarque-Bera	2.700971	2.411205	2.700971	14.32862
Probability	0.259114	0.299511	0.259114	0.000774
Sum	286412.1	17772.77	286412.1	207.6500

Sum Sq. Dev.	9.46E+08	17771131	9.46E+08	116.8434
Observations	**14**	**14**	**14**	**14**

Source: Author's Computation Using E-View 9.0, 2024.

Important trends in bank deposits (DMB), Digital Currency Transactions (DCT), Money Supply (M2), and Interest Rates (INR) are shown by the summary data. Significant financial development is shown by the mean DMB and M2 values of ₦20,458.01 billion, while increased digital transactions are reflected in the average DCT of ₦1,269.48 billion. With an average interest rate of 14.83%, the interest rate environment is typically high.

Early years with lesser quantities of digital transactions are shown by the median DCT of ₦641.99 billion, which is less than the mean. DCT peaked at ₦3,567.23 billion, while DMB and M2 values peaked at ₦40,000.30 billion. INR varied between 6.13% and 17.00%.

The standard deviations show variability, with substantial variations in DCT and significant variations in DMB and M2 (₦8,531.13 billion). Smaller fluctuations are reflected in INR's low standard deviation (2.99%). While INR is negatively skewed, suggesting lower interest rates in recent years, DMB, M2, and DCT seem to have a positive skew. While DMB, M2, and DCT are probably regularly distributed, the Jarque-Bera test indicates that INR deviates considerably from the normal distribution.

Stationarity Result

Table 4.2: Unit Root (Stationarity) Test

Time Series	ADF Statistics	1% Critical Value	5% Critical Value	10% Critical Value	Stationary Status
DMB	1.392220	-4.200056	-3.175352	-2.728985	I (1)
DCT	2.042027	-4.057910	-3.119910	-2.701103	I (1)
M2	1.392220	-4.200056	-3.175352	-2.728985	I (1)
INR	-5.246722	-4.057910	-3.119910	-2.701103	I (0)

The critical values for rejection of hypothesis of unit root were from MacKinnon (2015) as reported in E-views

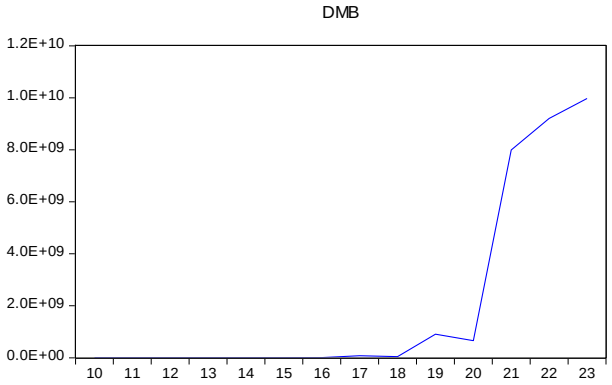
The Augmented Dickey-Fuller (ADF) test was used to perform a unit root test on the four variables (DMB, DCT, M2, and INR). With orders of integration of one; I (1), it was discovered that all four variables were non-stationary.

Based on the Augmented Dickey-Fuller (ADF) test, the unit root test results, shown in Table 4.2, show the stationarity status of the time series variables. These variables are non-stationary at levels but become static after taking their first differences, indicating that they are integrated of order 1, I (1). The ADF statistics for DMB (Deposit Money Bank), DCT (Digital Money Actions), and M2 (Money Supply) vary more than the 1%, 5%, and 10% critical values. The INR (Interest Rate), on the other hand, has an ADF statistic of -5.246722, which is below the critical values at every level. This suggests that the variable is integrated of order 0, I (0), and is stable at all levels. As a result, INR is already stationary, but DMB, DCT, and M2 are differenced to attain stationarity.

The Analysis Trend

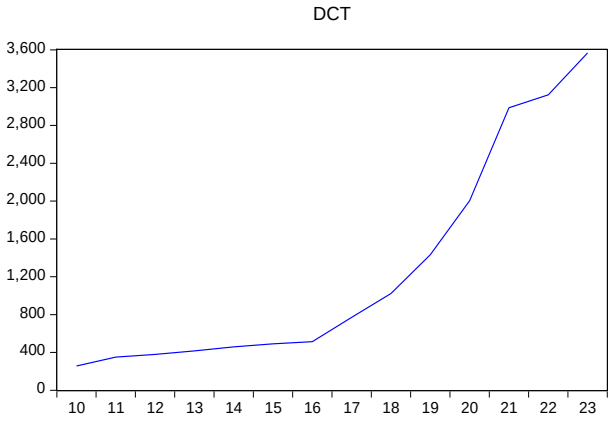
Several significant trends can be seen in the trend analysis of the variables DMB (Deposit Money Bank), DCT (Digital Currency Transactions), M2 (Money Supply), and INR (Interest Rate) from 2010 to 2023.

Fig. 4.1: Deposit Money Bank (DMB)



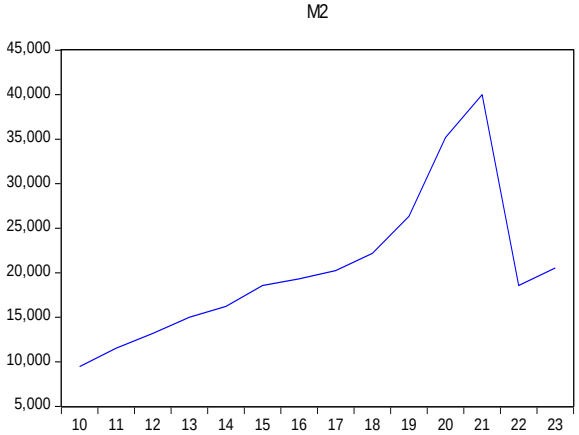
The payment Money Bank (DMB) variable has shown a considerable rising trend throughout the years, with a few major leaps in certain years, as seen in fig. 4.1. Beginning at 185,645.73 in 2010, DMB increases gradually until 2015, when a significant rise to 5,740,961 is seen. With significant increases, this trend continues, reaching a high of 9,974,497,338.48 in 2023. The biggest shift happens starting in 2017, when DMB values climb by magnitudes, which might be an indication of a sharp rise in deposit banking activity or asset accumulation in the banking industry. This dramatic rise can be the result of regulatory changes, structural adjustments, or a more general economic boom that increased bank assets and deposits.

Fig. 4.2: Digital Currency Transactions (DCT)



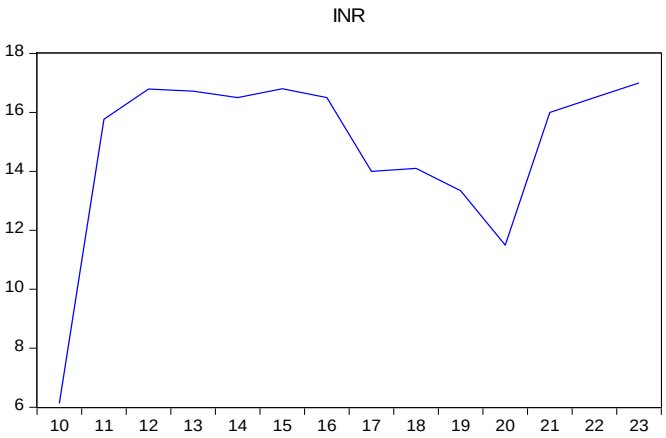
The fast use and emergence of digital money in financial activities is shown by the constant growth in Digital Currency activities (DCT) from 2010 to 2023 (Fig. 4.2). DCT was measured at 256.45 in 2010 and grew steadily every year until it reached 3,567.23 in 2023. This trend points to a gradual rise in the usage of digital money, which may be explained by advances in technology, a rise in digital literacy, and a move toward cashless transactions. Significantly, DCT prices surged sharply starting in 2019, which may be a result of the effects of financial technology advancements and digital currency legislation or of growing trust in digital transactions.

Fig. 4.3: Money Supply (M2)



A growth in the amount of money accessible in the economy is shown by the Money Supply (M2), which also shows a consistent rise from 2010 to 2023 (Fig. 4.3). M2 increased steadily from 9,456.7 in 2010 to 40,000.3 in 2021, but it then fluctuated, falling to 18,567.4 in 2022 before rising once again to 20,547.6 in 2023. This expansion, especially up to 2021, may indicate that central banks have been raising the money supply in an effort to boost the economy. However, as the government may have taken steps to regulate the expansion of the money supply, the oscillations seen in the last few years might be a sign of policy changes, economic adjustments, or responses to inflationary pressures.

Fig. 4.4: Interest Rate (INTR)



Costs of borrowing (INTR) have shown a more erratic trajectory over time, as seen in Fig. 4.4, which illustrates the fluidity of monetary policy changes. INTR increases from 6.13% in 2010 to a high of 16.79% in 2012, suggesting tighter monetary policy, maybe to stabilize the currency or limit inflation. The rates exhibit less significant variation from 2014 to 2023, often remaining in the range of 13% to 17%, with slight declines in 2020 (11.50%) and an increase to 17% by 2023. These variations show how the economy is responding to difficulties or attempts to control inflation while promoting economic expansion. The increase in rates by 2023 may be an attempt to fight inflation or stabilize the financial system, while the lower rates in 2020 may have been a part of an economic stimulus reaction to global economic slowdowns.

Table 4.3: Johansen's Cointegration Result

Eigen Value	Likelihood Ratio	5 per cent Critical Value
0.978102	69.91262	31.19092
0.703183	35.01861	22.10943
0.410826	17.18018	9.019843

Source: Author's Computation Using E-View 9.0

Cointegrated equations with chances (69.91262, 35.99021, and 17.18018) higher than the 5% critical values (31.19092, 22.10943, and 9.01731) are shown in the first three equations in table 4.3 above.

The three outputs of this test—eigenvalues, likelihood ratios, and the 5% critical value—indicate long-term equilibrium connections between the variables. These associations' strength is shown by the eigenvalues; the first value (0.978102) is quite high and suggests a significant correlation. Although they are lower, the second and third results (0.703183 and 0.410826) are nonetheless significant and point to the possibility of other, although weaker, correlations.

To ascertain if cointegration is present, each likelihood ratio is contrasted with its matching 5% critical value. At least one cointegrating vector is confirmed by the first likelihood ratio (69.91262), which is much higher than the critical value (31.19092). Indicating two additional cointegrating associations, the second (35.01861) and

third (17.18018) probability ratios also surpass their critical levels (22.10943 and 9.019843). Up to three cointegrating associations between the variables are confirmed by the overall likelihood ratios above the 5% threshold values, indicating a robust long-term link despite short-term changes.

Table 4.4 Error Correction Mechanism (ECM)

Dependent Variable: d (DMB (-1))

Independent Variables	**Coefficient**	**Standard Error**	**t-Statistic**	**P Value**
Constant Intercept	22.18472	18.67051	0.108701	0.9082
D (DCT (-1))	-0.447450	0.085020	4.092131	0.0015
D(M2(-1))	0.507037	0.043686	4.189144	0.0011
D (INR (-1))	0.495393	0.020827	5.953381	0.0000
ECM (-1)	-0.40896	0.201938	3.091484	0.0078
R^2	0.738330	**F-Statistic**	21.21176	
Adjusted R^2	0.601194	**DW-Statistic**	1.937766	

Source: Author's Computation Using E-View 9.0, 2024.

The Error Correction Mechanism (ECM) model sheds light on how the dependent variable, DMB\text {DMB}DMB, is affected by changes in the variables that were autonomously (Digital Currency Transactions, or DCT; Money Supply, or M2; and Interest Rate, or INR); it also shows how fast the dependent variable returns to long-term equilibrium. DMB\text {DMB}DMB is not significantly impacted by the constant term, as seen by its lack of statistical significance (p = 0.9082). The D (DCT (-1)) coefficient is -0.4475 (p = 0.0015), indicating a strong negative association in which a decrease in DMB\text {DMB}DMB corresponds to an increase in digital currency transactions. The positive coefficient (0.5070, p = 0.0011) for D(M2(-1)) suggests that DMB\text {DMB}DMB is increased by a larger money supply. Similarly, D (INR (-1)) indicates a positive and significant impact (0.4954, p = 0.0000), relating interest rate hikes to greater DMB\text {DMB}DMB.

A modest adjustment speed toward equilibrium is shown by the ECM (-1) term, which has a coefficient of -0.40896 (p = 0.0078), meaning that around 40.9% of disequilibrium is rectified each period. With an R-squared of 0.7383, the model explains roughly 73.8% of DMB\text {DMB}DMB fluctuations, and the Durbin-Watson value (1.9378) implies low autocorrelation, validating the model's trustworthiness. The regression equation's outcome is shown below:

d (RGDP (-1)) = 22.18472-0.447450d (DCT (-1)) + 0.507037d(M2(-1)) + 0.495393d(INR (-1)) -0.401911ECM
T (0.9082) (4.0127) (4.1891) (8.9019) (3,0914)

R2 is equal to 0.738330.

F-Statistics = 21.21176; D W Statistics = 1.927766; Adjusted R2 = 0.601194.

Analysis of the Findings

Significant correlations between the independent variables—digital exchanges of currency (DCT), money supply (M2), and interest rates (INR)—and the dependent variable, deposit money banks (DMB), are shown by the results of the Error Correction Mechanism (ECM) study.

First, there is an inverse link between DCT and DMB, as shown by the coefficient of -0.447450. This implies that a decline in deposits in deposit money institutions is linked to a rise in digital currency transactions. As more

people deal in digital currencies, they could take money out of conventional institutions to use or invest in these currencies. Given the rising tendency towards digital financial solutions at the cost of traditional banks accounts, this change may result in a decrease in total deposit levels.

On the other hand, M2's positive coefficient of 0.907037 suggests a robust positive correlation with DMB. This result implies that deposits in deposit money institutions grow sharply in tandem with an increase in the money supply. The link is probably the consequence of growing economic activity, which incentivizes firms and individuals to keep more cash in conventional banks. As a result, a larger money supply might improve liquidity and raise the number of deposits in the banking system.

At 3.095393, the interest rate coefficient (INR) is noticeably significant and shows a strong positive correlation with DMB. This suggests that because people and companies prefer to put their money in accounts that provide greater returns, higher interest rates are probably going to stimulate additional deposits in banks. The importance of this variable emphasizes how important interest rates are in determining deposit behavior in Nigeria and how advantageous interest rates might encourage deposit mobilization in the banking industry.

After a shock, the system corrects itself toward equilibrium at a rather modest pace, according to the ECM coefficient of -0.40896. This suggests that there is a way to gradually restore stable deposit levels in the event that there are deviations from the long-term equilibrium connection between DMB and the independent variables. The model's excellent explanatory power is shown by the R-squared value of 0.738330, which shows that the independent variables account for around 73.83% of the variation in DMB. The Durbin-Watson statistic of 1.937766 indicates that there is no substantial autocorrelation in the residuals, while the F-statistic of 21.21176 and its significance further corroborate the model's robustness. When taken as a whole, these results provide insightful information on the relationship between Nigerian traditional bank deposits and digital currencies.

Hypothesis Test

Applying the two-tailed test to the t-distribution table with a five percent significance level and fourteen degrees of freedom (n-k=14-4) yields a critical (tabulated) t value of 2.145.

First Hypothesis

First, we reject the null hypothesis regarding digital currency transactions since their computed value of 447450 is higher than the critical value of 2.145, suggesting that they have a significant long-term impact on Nigeria's productivity. Furthermore, the regression result showed that this considerable influence had a negative effect.

We accept the Null Hypothesis, which states that Money Supply has a significant long-term impact on Nigeria's deposit money since its computed value of 0.507037 is below the crucial threshold of 2.145.

Hypothesis Three

Regarding INTR (Interest Rate), we accept the null hypothesis as its computed value of 0.495393 is below the critical threshold of 2.145, suggesting that INTR (Interest Rate) has little long-term effect on Nigeria's deposit money.

F Data

Furthermore, this stance is supported by the F-statistic, whose result indicates that the model is substantial and well-defined. At the 5 percent level of significance, the essential F value 3.20 was derived from the F-distribution table with 5 percent and degree of freedom (v1 = k-1 = 4-1 = 3 and n-k=14-4 = 10). We reject the null hypothesis of the unimportant model since this number is lower than the computed value of 23.01, which suggests that the independent variables are important long-term explanatory factors of the DMB (Deposit Money Bank).

CONCLUSIONS AND RECOMMENDATIONS

The relationship between digital currency adoption and savings levels in Nigeria from 2010 to 2023 is complex and evolving. Digital currencies have exerted a significant negative impact on deposit money, illustrating the c

ompetitive threat they pose to traditional banking systems. However, the positive correlations between the mon ey supply and interest rates with deposit money highlight the continued relevance of traditional monetary polici es in promoting deposit mobilization. While digital currencies are reshaping the financial landscape, traditional banks remain pivotal in Nigeria's economy, underscoring the need for a regulatory approach that ensures a smo oth integration of digital currencies without compromising deposit stability.

Based on the study's findings, several policy recommendations are proposed. First, the Nigerian government an d regulatory bodies should establish a comprehensive regulatory framework to manage the integration of digita l currencies into the existing financial system. Traditional banks should form partnerships with fintech compani es to leverage digital currency technologies effectively. Additionally, financial institutions and regulators shoul d launch public awareness campaigns to enhance consumer understanding and acceptance of digital currencies. Finally, to keep pace with the growing trend of digital transactions, banks and other financial entities must inve st in upgrading their digital infrastructure.

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