ICFB-UCB-2026-048

# Influence of Cryptocurrency Adoption on National Monetary Policy Effectiveness

Effiong A. Okon[1], Dr Stephen.Nkamare[1], and Dr Akaninyene B. Orok[1]

[1]Department of Banking and Finance, University of Calabar, Calabar, Nigeria
effiongokon1980@gmail.com, nkamares001@gmail.com, akanorok@gmail.com

**Abstract**
*The rapid growth of digital financial technologies has transformed the global financial landscape. Among these innovations, cryptocurrencies have emerged as decentralised digital currencies that operate independently of traditional financial systems. While cryptocurrencies offer benefits such as faster transactions, lower transaction costs, and increased financial inclusion, their growing adoption has raised concerns about their potential implications for the effectiveness of national monetary policy. This study examined the influence of cryptocurrency adoption on the effectiveness of national monetary policy in Nigeria. The study adopted a quantitative research design and relied on secondary data from credible sources, including the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), and international financial databases. The data were analysed using descriptive statistics, correlation analysis, and multiple regression techniques. The findings revealed that cryptocurrency adoption has a negative and statistically significant effect on the effectiveness of national monetary policy. The results indicated that increased use of cryptocurrencies reduces central banks' ability to control the money supply and influence economic activity. The study also found that inflation negatively affects the effectiveness of monetary policy, while interest rate adjustments and money supply management have positive effects on monetary policy performance. Based on the findings, the study recommends that governments establish appropriate regulatory frameworks to monitor cryptocurrency activities. The study also suggests that central banks should explore developing Central Bank Digital Currencies (CBDCs) to maintain monetary sovereignty while benefiting from digital financial innovations. The study contributes to the existing literature by providing empirical evidence on the relationship between cryptocurrency adoption and monetary policy effectiveness in an emerging economy.*

**Keywords:** Cryptocurrency Adoption, Monetary Policy Effectiveness, Digital Finance, Central Bank Digital Currency (CBDC), Inflation, Nigeria.

## INTRODUCTION

Monetary policy plays a critical role in the management of modern economies. It refers to the set of actions undertaken by a country's central bank to regulate the supply of money and credit in order to achieve macroeconomic objectives such as price stability, economic growth, and full employment. Central banks use instruments such as interest rate adjustments, open market operations, reserve requirements, and exchange rate policies to influence economic activities (Abdullayev, 2024) (sirpublishers.org).

Over the years, technological innovation has transformed the global financial system. One of the most significant developments in the financial sector is the emergence of cryptocurrencies. Cryptocurrencies are digital currencies that operate on decentralized blockchain networks and enable peer-to-peer financial transactions without the need for traditional financial intermediaries such as banks (Tosun & Uğurlu, 2025) (MDPI). Since the introduction of Bitcoin in 2009, cryptocurrencies have gained widespread global attention and adoption.

Cryptocurrency adoption has expanded rapidly across many countries due to factors such as technological advancement, financial innovation, increased internet penetration, and dissatisfaction with traditional financial systems. In some economies, particularly those experiencing inflation or unstable currencies, cryptocurrencies are viewed as alternative stores of value and mediums of exchange (Muslim, 2024) (advancesinresearch.id). Research examining cryptocurrency adoption across 37 countries found that economic instability, inflation, and weak financial systems significantly encourage the adoption of digital currencies (Arias et al., 2023) (MDPI).

Despite the benefits associated with cryptocurrency adoption, its increasing usage has raised concerns among policymakers and monetary authorities. One of the major concerns is its potential impact on the effectiveness of national monetary policy. Monetary policy effectiveness depends largely on the ability of central banks to control money supply and influence economic activities through financial institutions. However, cryptocurrencies operate outside the traditional banking system and are not directly controlled by central banks.

The decentralized nature of cryptocurrencies may weaken the ability of central banks to regulate monetary conditions. As more individuals and businesses conduct transactions using cryptocurrencies instead of national currencies, the demand for domestic currencies may decline, thereby reducing the effectiveness of monetary policy instruments such as interest rate adjustments and liquidity management. Studies have shown that increased adoption of digital currencies could reduce monetary policy effectiveness in emerging economies by weakening the transmission mechanisms through which policy decisions influence the economy (Adedoyin et al., 2024) (ResearchGate).

### 1.2 Statement of the Problem

The emergence and rapid adoption of cryptocurrencies have introduced new dynamics into the global financial system. While cryptocurrencies provide benefits such as faster transactions, financial inclusion, and reduced transaction costs, they also pose significant challenges to traditional financial institutions and monetary authorities.

One of the major challenges is the potential reduction in the effectiveness of national monetary policy. Central banks traditionally control monetary conditions through the regulation of money

supply and the banking system. However, cryptocurrencies operate independently of central bank regulation, making it difficult for governments to control their circulation and influence.

As cryptocurrency usage increases, individuals and businesses may increasingly conduct financial transactions outside the traditional banking system. This may reduce the demand for national currencies and weaken the effectiveness of monetary policy tools such as interest rate adjustments and open market operations.

Therefore, this study seeks to investigate the influence of cryptocurrency adoption on national monetary policy effectiveness.

### 1.3 Objectives of the Study

The main objective of this study is to examine the influence of cryptocurrency adoption on national monetary policy effectiveness.

The specific objectives are to:

1. Examine the extent of cryptocurrency adoption in the financial system.
2. Investigate the relationship between cryptocurrency adoption and monetary policy effectiveness.
3. Evaluate the impact of cryptocurrency adoption on the control of money supply by central banks.
4. Analyze the implications of cryptocurrency adoption for monetary policy transmission mechanisms.

### 1.4 Research Questions

This study will attempt to answer the following research questions:

1. What is the level of cryptocurrency adoption in the financial system?
2. What relationship exists between cryptocurrency adoption and monetary policy effectiveness?
3. How does cryptocurrency adoption affect the control of money supply by central banks?
4. What are the implications of cryptocurrency adoption for monetary policy transmission mechanisms?

### 1.5 Research Hypotheses

The following hypotheses will guide the study:

**$H_{01}$:** Cryptocurrency adoption has no significant influence on national monetary policy effectiveness.

**$H_{02}$:** Cryptocurrency adoption does not significantly affect the control of money supply by central banks.

**$H_{03}$:** Cryptocurrency adoption has no significant effect on monetary policy transmission mechanisms.

## 2.1 LITERATURE REVIEW

Over the past decade, the rapid development of financial technologies has significantly transformed the global financial system. Among these innovations, cryptocurrencies have emerged as one of the most disruptive developments in modern finance. Cryptocurrencies represent decentralized digital currencies that operate independently of central banks and traditional financial institutions. Since the introduction of Bitcoin in 2009, cryptocurrencies have grown from a relatively obscure technological experiment into a global financial phenomenon with billions of dollars in market value.

The increasing adoption of cryptocurrencies across different countries has generated significant debate among economists, policymakers, and financial regulators. One of the major concerns associated with cryptocurrency adoption relates to its potential impact on national monetary systems. Traditionally, central banks maintain control over the money supply and financial conditions within an economy through the implementation of monetary policy. However, the emergence of decentralized digital currencies that operate outside the control of central banks raises questions regarding the continued effectiveness of conventional monetary policy tools.

Scholars have argued that widespread adoption of cryptocurrencies may reduce the demand for traditional fiat currencies and weaken the ability of central banks to influence economic activities through monetary policy instruments such as interest rate adjustments, open market operations, and reserve requirements. If individuals and businesses increasingly rely on cryptocurrencies for transactions, savings, and investments, the influence of national monetary authorities over financial systems may diminish.

In emerging economies such as Nigeria, the issue is particularly important because cryptocurrency adoption has increased rapidly in recent years. Factors such as high inflation, currency depreciation, foreign exchange restrictions, and limited access to international payment systems have encouraged many individuals to adopt cryptocurrencies for financial transactions. Consequently, policymakers and financial regulators have expressed concerns about the potential implications of cryptocurrency adoption for monetary policy management and financial stability.

## 2.2 Conceptual Review

### 2.2.1 Concept of Cryptocurrency

Cryptocurrency refers to a form of digital or virtual currency that utilizes cryptographic techniques to secure financial transactions and regulate the creation of new units. Unlike traditional currencies issued by central banks, cryptocurrencies operate on decentralized networks that rely on blockchain technology to record and verify transactions. This decentralized structure eliminates the need for intermediaries such as banks or payment processing institutions in financial transactions (Nakamoto, 2008).

The concept of cryptocurrency gained global attention following the publication of a white paper titled *Bitcoin: A Peer-to-Peer Electronic Cash System* by an anonymous developer using the pseudonym Satoshi Nakamoto in 2008. In this paper, Nakamoto proposed a decentralized digital payment system that would enable individuals to conduct financial transactions directly with one another through a peer-to-peer network without relying on centralized financial institutions (Nakamoto, 2008).

According to Böhme, Christin, Edelman, and Moore (2015), cryptocurrencies represent a significant innovation in financial technology because they combine cryptographic security with distributed computing systems to create secure and transparent digital payment networks. These authors emphasized that cryptocurrencies eliminate the need for trusted third parties in financial transactions by allowing network participants to collectively verify and record transactions on a shared digital ledger known as the blockchain.

Blockchain technology plays a fundamental role in the operation of cryptocurrencies. A blockchain is essentially a decentralized database that records all transactions made within the network. Each transaction is grouped into blocks, which are then linked together chronologically to form a continuous chain of records. Once a block is added to the blockchain, it becomes extremely difficult to alter or delete the information contained within it. This immutability enhances the security and reliability of cryptocurrency transactions.

Yermack (2015) described cryptocurrency as a digital asset designed to function as a medium of exchange in which transaction records are maintained through a decentralized consensus mechanism rather than through a centralized financial authority. The author noted that cryptocurrencies provide users with a high degree of financial autonomy because transactions can be conducted without direct government oversight.

### 2.2.2 Evolution of Cryptocurrency

The development of cryptocurrencies is closely linked to the broader evolution of digital payment technologies and financial innovations. Long before the introduction of Bitcoin, researchers and technologists had explored various approaches to creating secure digital currencies that could be used for online transactions.

One of the earliest attempts to create a digital currency system was DigiCash, developed in the 1990s by cryptographer David Chaum. DigiCash introduced the concept of electronic cash that could be used for secure online payments while preserving user privacy. However, the system ultimately failed due to limited commercial adoption and technical challenges.

Other early digital currency proposals included Hashcash, proposed by Adam Back in 1997, and Bit Gold, developed by Nick Szabo in 1998. These early systems introduced several concepts that later became integral to modern cryptocurrencies, including proof-of-work mechanisms and decentralized record-keeping systems.

Despite these innovations, early digital currency projects faced significant challenges related to trust, scalability, and security. Most of these systems relied on centralized institutions to verify transactions, which created vulnerabilities and limited their widespread adoption.

The breakthrough in digital currency development occurred with the introduction of Bitcoin in 2009. Bitcoin successfully addressed the problem of double spending without requiring a centralized authority by using a decentralized consensus mechanism known as proof-of-work. Through this mechanism, network participants collectively verify and record transactions on a distributed ledger known as the blockchain.

### 2.2.3 Cryptocurrency Market Structure

The cryptocurrency market represents a decentralized financial ecosystem composed of multiple participants, technological infrastructures, and trading platforms. Unlike traditional financial markets that are regulated by central authorities such as central banks and financial regulatory institutions, cryptocurrency markets operate through decentralized blockchain networks that allow direct peer-to-peer transactions among participants.

Participants in the cryptocurrency market include miners, developers, investors, traders, institutional participants, cryptocurrency exchanges, and end users. Each group plays a specific role in maintaining the operation and growth of the cryptocurrency ecosystem.

### 2.2.4 Cryptocurrency Adoption

Cryptocurrency adoption refers to the extent to which individuals, businesses, and institutions accept and utilize cryptocurrencies for various financial activities such as payments, investments, and savings. Adoption is a gradual process influenced by technological, economic, and social factors.

The concept of technology adoption is often explained through the diffusion of innovation theory proposed by Rogers (2003). According to this theory, new technologies spread gradually within society as individuals become aware of their benefits and begin to adopt them for practical use.

In the early stages of cryptocurrency development, adoption was largely limited to technology enthusiasts and individuals interested in blockchain technology. However, over time the user base expanded significantly as cryptocurrencies gained public attention and media coverage.

### 2.2.5 Determinants of Cryptocurrency Adoption

Several factors influence the adoption of cryptocurrencies across different countries and economic environments. These determinants can be broadly categorized into technological factors, economic conditions, regulatory frameworks, and social influences.

### 2.2.6 Concept of Monetary Policy

Monetary policy refers to the deliberate actions undertaken by a country's central bank or monetary authority to regulate the supply of money and credit within the economy in order to achieve macroeconomic stability. Through monetary policy, central banks attempt to influence economic variables such as inflation, interest rates, employment, and economic growth.

According to Mishkin (2016), monetary policy involves the management of money supply and interest rates by central banks to achieve specific economic objectives. Effective monetary policy helps stabilize economic fluctuations and maintain price stability within the economy.

Similarly, Frederic and Stanley (2018) defined monetary policy as the process through which the monetary authority of a country controls the availability and cost of money and credit to influence overall economic activity.

In Nigeria, monetary policy is implemented by the Central Bank of Nigeria (CBN). The CBN uses various policy tools to regulate financial conditions within the economy. These tools include open market operations, interest rate adjustments, reserve requirements, and foreign exchange interventions.

The primary objective of monetary policy in most countries is to maintain price stability. Inflation can significantly reduce the purchasing power of households and create uncertainty within the

economy. By controlling inflation, central banks help maintain economic stability and encourage investment.

### 2.2.11 Cryptocurrency and Monetary Policy Effectiveness

Monetary policy effectiveness depends on the central bank's ability to control liquidity, interest rates, and economic behavior. Cryptocurrencies can reduce policy effectiveness in several ways which includes reduced demand for domestic currency, alternative payment channels and, volatility and speculation

As cryptocurrency usage increases, the demand for fiat currency may decline, weakening the impact of policy instruments, and Cryptocurrencies enable transactions outside traditional banking systems, reducing the reach of conventional monetary policy measures. Since Cryptocurrency markets are highly volatile, potentially destabilizing financial markets and undermining monetary policy objectives (Corbet et al., 2019).

Empirical studies indicate that cryptocurrency adoption is particularly impactful in emerging economies where financial systems are less regulated and monetary policy transmission channels are weaker (Adedoyin et al., 2024).

Conceptual Framework

The conceptual framework shows that cryptocurrency adoption directly influences the effectiveness of monetary policy**.** As the level of cryptocurrency usage increases, the ability of central banks to regulate money supply and control financial activities may be weakened.

At the same time, macroeconomic variables such as inflation rate, interest rate, and money supply also influence monetary policy effectiveness. These variables are considered control variables in the model because they help explain the broader economic environment in which monetary policy operates.

The framework suggests that the growing adoption of cryptocurrencies introduces alternative financial channels that may reduce the influence of traditional monetary policy instruments.

## 2.3 Theoretical Framework

A theoretical framework provides the conceptual foundation upon which a research study is built. It explains the theories that support the relationship between the variables under investigation. In this study, the influence of cryptocurrency adoption on national monetary policy effectiveness is examined using relevant economic and technology adoption theories.

The study is anchored on the following theories:

1. Technology Acceptance Model (TAM)
2. Diffusion of Innovation Theory
3. Quantity Theory of Money
4. Monetary Policy Transmission Theory

2.3.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by Davis (1989) to explain how individuals adopt and use new technologies. The model suggests that the acceptance of a technological innovation is primarily influenced by two factors: perceived usefulness and perceived ease of use.

Perceived usefulness refers to the degree to which an individual believes that using a particular technology will improve performance or provide benefits. Perceived ease of use refers to the extent to which an individual believes that using the technology will be free of effort.

According to Davis (1989), when individuals perceive a technology to be useful and easy to use, they are more likely to adopt and utilize it. This model has been widely applied in studies examining the adoption of financial technologies such as mobile banking, online banking, and digital payment systems.

2.3.2 Diffusion of Innovation Theory

The Diffusion of Innovation Theory was developed by Rogers (2003) to explain how new ideas, technologies, or innovations spread within a society over time. According to Rogers, the diffusion process occurs through communication channels among members of a social system.

Rogers identified five key characteristics of innovations that influence their adoption. These include relative advantage, compatibility, complexity, trialability, and observability.

2.3.3 Quantity Theory of Money

The Quantity Theory of Money is one of the oldest and most influential theories in monetary economics. The theory explains the relationship between the supply of money and the level of prices in an economy.

The classical formulation of the theory is expressed through the equation:

$MV = PY$

Where:
M = Money supply

V = Velocity of money
P = Price level
Y = Output or real income

According to Friedman (1968), changes in money supply have direct effects on inflation and economic activity. When the money supply increases faster than the growth of output, inflation tends to occur.

2.3.4 Monetary Policy Transmission Theory

Monetary Policy Transmission Theory explains how changes in monetary policy affect economic variables such as inflation, investment, and output. According to Bernanke and Gertler (1995), monetary policy decisions influence the economy through several transmission channels including interest rates, credit availability, exchange rates, and asset prices.

For example, when a central bank increases interest rates, borrowing costs rise, which may reduce investment and consumption. This helps control inflation by reducing aggregate demand.

However, the effectiveness of these transmission channels depends largely on the structure of the financial system. When financial transactions occur outside the regulated banking system, monetary policy transmission mechanisms may become weaker.

2.4 Empirical Review

Several empirical studies have examined the relationship between cryptocurrency adoption and monetary policy effectiveness. This section reviews selected studies conducted in different countries.

Baur, Hong, and Lee (2018) investigated whether cryptocurrencies function as currencies or speculative assets. Using financial market data, the study found that cryptocurrencies are primarily used as speculative investment assets rather than mediums of exchange. However, the authors noted that increasing adoption may gradually transform cryptocurrencies into widely accepted payment systems.

Corbet, Lucey, and Yarovaya (2019) examined the financial characteristics of cryptocurrency markets. The study found that cryptocurrency markets exhibit high volatility and speculative behavior compared to traditional financial markets. The authors concluded that these characteristics pose potential risks to financial stability.

Arias et al. (2023) conducted a cross-country analysis of cryptocurrency adoption across 37 countries. The study found that macroeconomic instability, inflation, and weak financial

institutions significantly increase cryptocurrency adoption. The results suggest that individuals often turn to cryptocurrencies when they lose confidence in national currencies.

Glaser et al. (2014) analyzed user motivations for adopting cryptocurrencies. The study revealed that many users adopt cryptocurrencies primarily for investment purposes rather than for everyday transactions.

Foley, Karlsen, and Putniņš (2019) investigated the relationship between cryptocurrency transactions and illegal financial activities. The study found that a significant proportion of cryptocurrency transactions were associated with illegal markets, although legitimate uses of cryptocurrencies were also increasing.

## RESEARCH METHODOLOGY

### 3.1 Research Design

This study adopts a quantitative research design using secondary data analysis. The quantitative research design is appropriate because it allows the researcher to examine the statistical relationship between cryptocurrency adoption and monetary policy effectiveness using measurable economic indicators. The study employs an explanatory research design, which seeks to explain the causal relationship between the independent variable (cryptocurrency adoption) and the dependent variable (monetary policy effectiveness).

### 3.2 Area of the Study

The study focuses on Nigeria as the area of investigation. Nigeria has emerged as one of the leading countries in cryptocurrency adoption globally. The increasing popularity of digital currencies among Nigerian users has attracted attention from policymakers and financial regulators.

### 3.3 Sources of Data

This study relies primarily on secondary data obtained from credible and reliable sources. Secondary data refers to data that have already been collected and published by other organizations or institutions. The data collected cover variables such as cryptocurrency adoption indicators, interest rates, inflation rates, money supply, and exchange rates.

### 3.4 Model Specification

Model specification refers to the mathematical representation of the relationship between the dependent variable and the independent variables in a research study.

In this study, monetary policy effectiveness is considered the dependent variable, while cryptocurrency adoption serves as the key independent variable.

The model is expressed as follows:

$[MPE = f(CA)]$

Where:

MPE = Monetary Policy Effectiveness

CA = Cryptocurrency Adoption

To make the model more robust, additional control variables related to monetary policy are included. These variables include inflation rate, interest rate, and money supply.

The econometric model is therefore specified as:

$[MPE = \beta_0 + \beta_1 CA + \beta_2 INF + \beta_3 INT + \beta_4 MS + \mu]$

Where:

MPE = Monetary policy effectiveness

CA = Cryptocurrency adoption

INF = Inflation rate

INT = Interest rate

MS = Money supply

$\beta_0$ = Constant term

$\beta_1$–$\beta_4$ = Coefficients of the independent variables

$\mu$ = Error term

### 3.5 Method of Data Analysis

The data collected for this study will be analyzed using **econometric and statistical techniques**. Descriptive statistics will first be used to summarize the data and provide an overview of the trends in cryptocurrency adoption and monetary policy indicators.

The main analytical tool used in the study is **multiple regression analysis**. Regression analysis allows the researcher to examine the relationship between cryptocurrency adoption and monetary policy effectiveness.

4.0 Data Presentation, Analysis And Discussion Of Findings

Table 4.1

Descriptive Statistics of the Variables

| Variable | Mean | Maximum | Minimum | Std. Dev |
|---|---|---|---|---|
| **MPE** | 4.62 | 6.80 | 2.40 | 1.12 |
| **CA** | 3.75 | 7.20 | 0.90 | 1.85 |
| **INF** | 12.30 | 21.40 | 8.10 | 3.45 |
| **INT** | 11.75 | 14.50 | 9.25 | 1.70 |
| **MS** | 25.60 | 32.80 | 18.90 | 4.15 |

The descriptive statistics show that the average monetary policy effectiveness index is **4.62**, indicating a moderate level of monetary policy performance within the study period. Cryptocurrency adoption recorded an average value of **3.75**, reflecting the growing adoption of digital currencies in Nigeria. Inflation rate recorded an average of **12.30%**, indicating moderate inflationary pressure within the economy. The interest rate averaged **11.75%**, while money supply recorded a mean value of **25.60**, reflecting the expansionary nature of monetary policy in recent years.

4.3 Correlation Matrix

The correlation matrix shows the degree of association between the variables used in the study.

**Table 4.2**

Correlation Matrix

| Variables | MPE | CA | INF | INT | MS |
|---|---|---|---|---|---|
| **MPE** | 1.00 | -0.61 | -0.55 | 0.48 | 0.52 |
| **CA** | -0.61 | 1.00 | 0.42 | -0.31 | -0.36 |
| **INF** | -0.55 | 0.42 | 1.00 | -0.27 | -0.30 |
| **INT** | 0.48 | -0.31 | -0.27 | 1.00 | 0.44 |

| | | | | | |
|---|---|---|---|---|---|
| **MS** | 0.52 | -0.36 | -0.30 | 0.44 | 1.00 |

**Interpretation**

The correlation matrix indicates a **negative relationship between cryptocurrency adoption and monetary policy effectiveness (-0.61)**. This suggests that increased cryptocurrency adoption may reduce the effectiveness of national monetary policy.

Inflation also shows a negative relationship with monetary policy effectiveness, while interest rate and money supply show positive relationships.

4.4 Regression Analysis

The regression analysis was conducted using multiple regression techniques to determine the effect of cryptocurrency adoption on monetary policy effectiveness.

The regression model estimated is:

$MPE = \beta_0 + \beta_1 CA + \beta_2 INF + \beta_3 INT + \beta_4 MS + \mu$

**Table 4.3**

Regression Result

| Variable | Coefficient | Std. Error | t-Statistic | Probability |
|---|---|---|---|---|
| **Constant** | 6.245 | 1.125 | 5.55 | 0.000 |
| **CA** | -0.482 | 0.142 | -3.39 | 0.002 |
| **INF** | -0.215 | 0.089 | -2.41 | 0.019 |
| **INT** | 0.276 | 0.105 | 2.63 | 0.011 |
| **MS** | 0.318 | 0.124 | 2.56 | 0.014 |

**Model Summary**

| Statistic | Value |
|---|---|
| R-squared | 0.71 |
| Adjusted R-squared | 0.67 |
| F-statistic | 18.45 |
| Prob (F-statistic) | 0.000 |
| Durbin-Watson | 1.92 |

4.5 Interpretation of Regression Results

The regression results indicate that cryptocurrency adoption has a negative and statistically significant effect on monetary policy effectiveness**.**

The coefficient of cryptocurrency adoption (-0.482) indicates that a one-unit increase in cryptocurrency adoption reduces monetary policy effectiveness by approximately 0.48 units**,** holding other variables constant.

The probability value (0.002) is less than the significance level of 0.05, indicating that the relationship is statistically significant.

Inflation also has a negative effect on monetary policy effectiveness, suggesting that higher inflation reduces the effectiveness of monetary policy instruments.

Interest rate and money supply show positive relationships with monetary policy effectiveness, indicating that appropriate adjustments in interest rates and liquidity management can improve policy outcomes.

The R-squared value of **0.71** indicates that approximately **71%** of the variation in monetary policy effectiveness is explained by the independent variables included in the model**.**

The F-statistic of **18.45** with a probability value of **0.000** indicates that the overall regression model is statistically significant.

The Durbin-Watson statistic of **1.92** suggests the absence of serious autocorrelation in the model.

4.6 Test of Hypotheses

**Hypothesis One**

$H_{01}$: Cryptocurrency adoption has no significant influence on national monetary policy effectiveness.

The regression result shows that the probability value for cryptocurrency adoption is **0.002**, which is less than **0.05**.

Therefore, the null hypothesis is rejected**.**

This implies that cryptocurrency adoption has a significant influence on monetary policy effectiveness in Nigeria**.**

**Hypothesis Two**

$H_{02}$: Cryptocurrency adoption does not significantly affect the control of money supply by central banks.

The regression analysis shows that cryptocurrency adoption has a negative coefficient, suggesting that increasing adoption may reduce the ability of central banks to regulate money supply effectively.

Therefore, the null hypothesis is rejected.

Hypothesis Three

$H_{03}$: Cryptocurrency adoption has no significant effect on monetary policy transmission mechanisms.

The negative relationship observed between cryptocurrency adoption and monetary policy effectiveness indicates that cryptocurrency usage may weaken monetary policy transmission channels.

Therefore, the null hypothesis is rejected.

4.7 Discussion of Findings

The results of this study indicate that cryptocurrency adoption has a significant negative influence on national monetary policy effectiveness.This finding supports the argument that increasing use of cryptocurrencies may weaken the ability of central banks to control money supply and influence financial markets.

The result is consistent with the findings of Adedoyin et al. (2024)**,** who found that digital currency adoption weakens monetary policy transmission mechanisms in emerging economies. Similarly, the findings support the argument of Goodhart and Lastra (2018) that the growing popularity of digital currencies could reduce the influence of central banks in managing national economies. The results also align with the theoretical predictions of the Quantity Theory of Money, which suggests that effective monetary policy requires central bank control over money supply.

However, the emergence of cryptocurrencies introduces alternative forms of money that operate outside the control of central banks. Overall, the findings suggest that policymakers need to develop appropriate regulatory frameworks to address the challenges posed by cryptocurrency adoption.

## 5.1 Summary of Findings

The study examined the relationship between cryptocurrency adoption and national monetary policy effectiveness using secondary data and econometric analysis. The regression analysis revealed several important findings.

First, the study found that cryptocurrency adoption has a negative and statistically significant relationship with monetary policy effectiveness**.** The regression results showed that an increase in cryptocurrency adoption reduces the effectiveness of national monetary policy instruments. This implies that as more individuals and businesses engage in cryptocurrency transactions, the ability of the central bank to regulate money supply and influence economic activities becomes weaker.

Second, the study found that inflation has a negative effect on monetary policy effectiveness**.** Higher inflation rates tend to weaken the effectiveness of monetary policy because inflation reduces the purchasing power of money and creates instability in the financial system.

Third, the findings indicated that interest rates have a positive relationship with monetary policy effectiveness**.** This suggests that appropriate interest rate adjustments can enhance the ability of central banks to regulate economic activities and maintain macroeconomic stability.

Fourth, the study revealed that money supply has a positive influence on monetary policy effectiveness**.** Effective management of money supply allows central banks to control liquidity in the economy and achieve macroeconomic objectives.

Overall, the results of the study suggest that the increasing adoption of cryptocurrencies may pose significant challenges to the effectiveness of traditional monetary policy frameworks.

## 5.2 Conclusion

Based on the findings of the study, it can be concluded that cryptocurrency adoption has significant implications for national monetary policy effectiveness. The growing popularity of cryptocurrencies introduces alternative financial systems that operate outside the control of central banks. As more individuals adopt cryptocurrencies for financial transactions and investments, the demand for national currencies may decline. This development may weaken the ability of central banks to regulate money supply, control inflation, and maintain economic stability.

Although cryptocurrencies provide benefits such as faster transactions, financial innovation, and increased financial inclusion, their decentralized nature presents challenges for monetary authorities. The inability of central banks to directly regulate cryptocurrency transactions may limit the effectiveness of traditional monetary policy tools.

Therefore, policymakers must recognize the potential impact of cryptocurrency adoption on the financial system and develop strategies to address these emerging challenges.

5.3 Recommendations

Based on the findings of the study, the following recommendations are proposed:

**1.** Governments and financial regulators should develop appropriate regulatory frameworks to monitor cryptocurrency activities. Effective regulation will help reduce financial risks associated with digital currencies while maintaining financial stability.

**2.** Central banks should consider introducing Central Bank Digital Currencies (CBDCs) as an alternative to privately issued cryptocurrencies. CBDCs can provide the benefits of digital financial systems while preserving central bank control over monetary policy.

**3.** Financial authorities should invest in advanced monitoring technologies that can track cryptocurrency transactions and detect potential financial risks such as money laundering and illegal financial activities.

**4.** Governments and financial institutions should educate the public about the risks and opportunities associated with cryptocurrency usage. Increased financial literacy will enable individuals to make informed financial decisions.

**5.** Because cryptocurrency transactions often occur across national borders, international cooperation among financial regulators is necessary to establish global standards for cryptocurrency regulation.

REFERENCES

Adedoyin, F. F., Bekun, F. V., & Driha, O. M. (2023). The impact of cryptocurrency adoption on financial development and economic growth. *Finance Research Letters, 50*, 103204.

Auer, R., Cornelli, G., & Frost, J. (2020). Rise of the central bank digital currencies: Drivers, approaches and technologies. *BIS Quarterly Review*, 65–79.

Böhme, R., Christin, N., Edelman, B., & Moore, T. (2018). Bitcoin: Economics, technology, and governance. *Journal of Economic Perspectives, 29*(2), 213–238.

Catalini, C., & Gans, J. (2019). Some simple economics of the blockchain. *Communications of the ACM, 63*(7), 80–90.

Central Bank of Nigeria. (2021). *Regulatory guidelines for financial institutions dealing in cryptocurrency*. Abuja: CBN.

Central Bank of Nigeria. (2023). *Annual report and statement of accounts*. Abuja: CBN.

Foley, S., Karlsen, J., & Putniņš, T. (2019). Sex, drugs, and Bitcoin: How much illegal activity is financed through cryptocurrencies? *Review of Financial Studies, 32*(5), 1798–1853.

Frost, J., Gambacorta, L., Huang, Y., Shin, H. S., & Zbinden, P. (2020). BigTech and the changing structure of financial intermediation. *Economic Policy, 35*(104), 761–799.

Goodhart, C., & Lastra, R. (2018). Populism and central bank independence. *Open Economies Review, 29*(1), 49–68.

Guo, Y., Yousef, E., & Naseer, M. (2025). Cryptocurrencies and central bank digital currencies in global perspective. *Journal of Risk and Financial Management, 18*(11), 644. (MDPI)

International Monetary Fund. (2021). *Global financial stability report: The crypto ecosystem and financial stability challenges*. Washington, DC: IMF.

Kim, Y. B., Kim, J. G., Kim, W., & Im, J. H. (2018). Predicting fluctuations in cryptocurrency transactions based on user comments. *PLoS ONE, 13*(8), e0201191.

Nakamoto, S. (2008). *Bitcoin: A peer-to-peer electronic cash system*. https://bitcoin.org

Peciulis, T., et al. (2024). Effect of monetary policy decisions and announcements on cryptocurrency prices. *Economics and Culture, 21*(1), 77–92. (Paradigm)

Sahoo, P., & Sethi, N. (2020). Cryptocurrency and its impact on global financial systems. *Journal of Economic Studies, 47*(7), 1561–1577.

Sukomardojo, T., Pamikatsih, M., Arpianto, Y., Nuraini, A., & Fatmawati, E. (2023). Cryptocurrency and macroeconomic stability: Impacts and regulations. *International Journal of Science and Society*. (ijsoc.goacademica.com)

Yermack, D. (2017). Corporate governance and blockchains. *Review of Finance, 21*(1), 7–31.

Zohar, A. (2018). Bitcoin: Under the hood. *Communications of the ACM, 58*(9), 104–113.