

Research Article

Nigeria's Fintech Conundrum: Weighing the Trade-offs Between Financial Inclusion, Innovation and Monetary Policy Effectiveness

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Abstract

Technological evolution has been responsible for the disruption of traditional systems within various spheres of human endeavors including the financial system. Although this evolution has been considered by some to be the tailwind that would propel seamlessness within the system, some others have welcomed it with mild to extreme paranoia. More concerning is the stance of various global regulators on the financial technology (fintech) revolution which does not appear to be consensual. Some regulators consider fintech revolution as the “next big thing” that should be allowed to thrive while some consider it to be the potential bane of the financial ecosystem; leading to conflicting regulatory approach towards fintech across the world as some regulators allowed the thriving of fintech in many forms while others maintain extreme conservative stance such as the imposition of ban and even potential prosecution. However, either for or against, the concern of all regulators can be summarized into one which is the implication of this revolution on monetary policy effectiveness. Thus, this study examined the effect of financial technology disruption on monetary policy effectiveness in Nigeria between 2012 and 2022. The study measured monetary policy effectiveness via inflation rate as the rate of inflation within the economy remains a major pointer to the effectiveness of the monetary policies of the government. Also, as measures of financial technology, Bitcoin (BTC) price, volume of Automated Teller Machines (ATM), Point of Sale (POS) and mobile money transactions were used as independent variables in the study. The ordinary least square (OLS) technique was used for analysis in the study and it was reported that fintech disruption has no significant effect on monetary policy effectiveness in Nigeria. Therefore, it is recommended that a synergy should be created between the Fintech ecosystem and the monetary system in Nigeria via a single encompassing reporting framework covering all the various components of Fintech system in Nigeria including cryptocurrency.

Keywords

Fintech, Monetary Policy, Inflation Rate, Cryptocurrency

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1. Introduction

The advent of technology has shaped the globe as well as the direction of human activities in significant ways and the global financial system is not exempted. Specifically, the major differentiating factor separating the fourth and fifth industrial revolution from other previous industrial revolutions is the presence of advanced digital technology which like a tsunami is shifting and reshaping everything on its path. Meanwhile, considering the fact that money appears to be the bedrock of the economy, technology has equally impacted the monetary ecosystem across the world to the point of giving money a digital form that can be moved across the world wide web without barriers. Some of these new digital forms assumed by money as a result of technological advancement include cryptocurrency, digital assets like gift cards, neo-banking among others which facilitate seamless movement of fiat money in the various forms assumed by these categories of digital money. Thus, the integration of technology into the global financial system has led to the emergence of financial technology popularly referred to as “Fintech”.

Fintech has affected nearly all aspects of the financial ecosystem. Based on the Nigeria Fintech Map which detailed the emerging Fintech ecosystem, there are about 14 broad categories mirrored after the traditional financial system. Some of these Fintech categories include crowdfunding, lending and financing, cryptocurrency and block chain technology, savings and investment, insurTech (Insurance tech), digital banking, mobile money and payment service providers, cross border payments among others [1]. Therefore, given the flexibility and fluidity associated with globalization which has largely impacted financial technology, several concerns have been raised by regulators about the emergence of Fintech which has led to strict regulation of the system. Usually, the Fintech ecosystem has been reported to make terrorism financing and money laundering more seamless due to the anonymous and cryptic nature of some of the platform usability. In 2023, it was reported that Hamas which has been regarded as one of the leading terrorist organisations moved money across various international borders without scrutiny via cryptocurrency [6]. This has led to several stringent regulations such as know-your-customer (KYC) and anti-money laundering (AML) regulations within the fintech ecosystem.

Also, another major concern of regulators about the Fintech system especially for the platforms that are largely built on decentralized finance (DeFi) is the existence of “wardrobe money” which the system tends to facilitate. Wardrobe money in this context refers to the existence of money outside the control of regulators and monetary authorities. Therefore, the presence of such money flows outside the control of monetary authorities are assumed to frustrate the policies of the regulators [19]. Specifically, in situations when there is a large quantity of ‘wardrobe money’ in an economy and less of controlled money, monetary authorities may assume by the

data that there is need to pump more funds into the economy. However, such move may lead to significant inflation due to the large reserve of ‘wardrobe money’ already littered around economy most probably via unregulated digital forms.

In Nigeria, there has been a lot of issues between the Fintech and traditional system as further explicated in the conceptual literature of this study. In 2023 and 2024, on several occasions have the monetary authorities developed stringent regulations including outright ban of certain fintech activities in the country on several claims of terrorism financing and monetary policy ineffectiveness [18]. However, there still exists no single robust and encompassing fintech regulatory in the country [15]. Just as it is on the field, the paucity and scarcity of contributions on Fintech and monetary policy effectiveness in Nigeria also appears to be few in extant literature. Thus, it is on the basis of the foregoing that this study empirically examines the impact of fintech on monetary policy effectiveness in Nigeria using data pertaining to cryptocurrency, mobile money services and other relevant Fintech data.

2. Literature Review

2.1. Conceptual Literature

Financial Technology and Monetary Policy Effectiveness: Nigeria in Retrospect

Financial technology can be regarded as the wide array of digital technologies that enhance and transform the offering of financial services through the displacement or modification of existing financial models via the innovation of new models. This wide array covers several elements such as the conventional automated teller machines and point of sales terminals to the more nascent digital finance and neobanking, cryptocurrency and blockchain system, application programming interface (API), digital payment as well as the infusion of robotics into the financial system such as robo-advisors and robo-trading. Specifically, the United Nations Economist Network considers Fintech as a major driver of financial inclusion and the basis of the widely perceived fourth industrial revolution which is known for the end-to-end digitalization of assets as integrated into a digital ecosystem [26]. On the other hand, monetary policy is regarded as the policies, strategies and procedures used by the monetary authority of a country to exert control over the value, availability, direction, cost and supply of money with the aim of achieving monetary objectives [4]. These objectives include price stability, exchange rate stability, economic growth among others which have evolved to be metric systems to measure the effectiveness of a country’s monetary policy regime.

In Nigeria, the Fintech industry has gained significant momentum in recent years as it was reported that the Fintech sector is currently the largest subsector within the Nigerian

technological space and has bolstered the economy of Nigeria over time while also disrupting the financial sector much more than any other force at the moment [15]. The Fintech space in the country is rapidly evolving and one of such proofs is the transition from the use of the usual Automated Teller Machines (ATMs) to the widely distributed Point of Sale Terminal (POS) which now brings the bank and cash closer to the people in their remote localities howbeit, at a price. Often times, POS operators who equally withdraw in bulk from the ATMs most times and sometimes, over-the-counter charge high fees on withdrawals technically placing the system as though the customers are buying the money in their bank accounts at ridiculous prices further contributing to inflation in the economy [7]. This has led to several warnings from the Central Bank of Nigeria in an attempt to equally curb this downside to POS integration into the financial sector of the economy [25]. The FinTech space in the country is established along the lines of digital banking, payment systems, cryptocurrency, blockchain and digital currencies, investment management and crowdfunding, lending and digital credit, insurance and advisory services. Meanwhile, it is widely perceived across the country that the Fintech ecosystem within the country has engendered financial inclusion via the various technologies behind neo-banking, instant payment platforms and point of sale technology. In addition, the emergence of various startups and other firms within the ecosystem has engendered employment and also contributed to the total productivity of the country. As at 2023, the fintech ecosystem in Nigeria housed about 217 fintech firms which is about 32% of the fintech market in Africa [3].

Premised on the data provided by the Nigeria Inter-Bank Settlement System (NIBSS), there was an increase in the value of instant payments by 42% in 2022 with 387 trillion Naira as against 2021 with 272 trillion Naira with a 50% increase in the NIBSS transaction volume from 3.4 billion Naira in 2021 to 5.1 billion Naira in 2022 [2]. Although this inclusion was driven by the cashless policy of the Central Bank of Nigeria, it was majorly facilitated and executed via the financial technology structure within the country. Furthermore, apart from driving financial inclusion in Nigeria, the Fintech space in Nigeria has attracted capital including foreign direct investment to the country via their various funding deals. Specifically, in 2022 alone, Flutterwave was reported to raise about \$250 million, Interswitch raised \$110 million while Moniepoint raised \$50 million among many other deals that has emerged as proof of the excellence of the country's Fintech space and the evidence of trust of global entities in the ecosystem [15].

On the flip side, perhaps due to the sharp difference between the conventional financial system which is majorly driven by dichotomy between the old banking models and the new financial technology among other reasons, there still exists some sort of acrimony between the conventional monetary system and Fintech heralds in Nigeria [27]. For instance, in 2021, the Central Bank of Nigeria (CBN) banned local

financial institutions from dealing in crypto-assets owing to regulatory concerns such as cybercrime, terrorism financing, money laundering and volatility of cryptocurrencies. Also, as at June 2024, the website of all crypto-related entities like Binance and Coinbase were rendered inaccessible in Nigeria. Nevertheless, crypto adoption in Nigeria appears to increase as the country was ranked as the 2nd globally only after India in the 2023 global crypto adoption index by Chainalysis [10]. Furthermore, in October 2023, conventional banks in Nigeria restricted consumer fund transfers to neobanks like Kuda, Moniepoint, Opay among others due to reasons speculated by the media to be related to concerns on fraud and cybercrime [27].

Also, in 2024, Binance and other cryptocurrency firms were banned from operating in Nigeria following the bank of AbokiFX – a live foreign exchange (FX) updating platform in 2023 all based on the accusation that the FX platform and other crypto firms engage in FX speculation and manipulation, facilitate terrorism and cybercrimes as well as being responsible for the falling rates of the Naira against the dollar [12]. In addition, neobanks were banned from onboarding new customers in April 2024 in Nigeria on the basis of facilitating cryptocurrency trading [18]. This was after the arrest and detention of executives of Binance (the largest cryptocurrency firm) in the country in March 2024 due to the allegation that the platform of the firm was used for money laundering and terrorism financing [5]. However, it is thought-provoking to realize that this is Nigeria's state on fintech adoption when other countries like the USA are already adopting Fintech and providing regulatory framework on their adoption.

Furthermore, one of the major challenges posed by some Fintech firms (especially those running decentralized finance – DeFi) as highlighted by most monetary authorities across the world is the tendency for the Fintech superstructure and the money flows within it to exist outside the control of monetary and regulatory authorities [19]. Therefore, this poses a major threat to the monetary system of any nation and also weakens the effectiveness of the monetary policies established in the economy. However, in the wake of the perceived benefits and threats of the Fintech space in the country as well as the presence of several monetary and finance related regulations in Nigeria by the CBN, there seems to be no single elaborate Fintech regulatory framework in the country [15].

2.2. Theoretical Literature

2.2.1. Innovation Diffusion Theory

The innovation diffusion theory was established by [20] and has undergone several reviews ever since. The theory is a major theoretical explanation of evolving innovation and technologies as well as the spread of such technologies across the entire strata of human existence. Simply put, the theory provides a theoretical approach to the diffusion of technological evolution. In other words, the theory considers inno-

vation diffusion as the spread of technological ideas across societies and institutions in various stages [11]. The theory assumes that there are five major kinds of people across every innovation diffusion process. These include the innovators, early adopters, early majority, late majority and laggards [20]. The innovators are usually the first to embrace the new technological ideas within the social strata because they are usually risk lovers and adventurers while the early adopters are those who embrace new technological ideas for the sole purpose of deriving economic, financial or personal satisfaction. On the other hand, the early majority are the mass majority who set the pace for the popularized use of the idea within the society. They are usually larger in number than the early adopters thereby forming a trendy pattern around the idea.

Furthermore, the fourth category includes the late majority who are the mass majority that adopt the technological idea after the early majority have implemented and proved the idea to be worthwhile. The late majority are usually risk averse than the early majority as they always ensure that the ideas are properly tested before adoption. However, the laggards are the most risk averse among the subsets as they generally lag behind in the adoption of technological ideas. They are usually not fascinated, swayed or impressed by the public traction gained by the idea to the point of adoption. Therefore, this category of people usually adopts these new technologies when it has been generally accepted as the new normal or only alternative to an existing ineffective conventional or traditional method. A practical illustration of innovation diffusion theory in Nigeria from a financial technology perspective is the diffusion and adoption of cryptocurrency (Bitcoin) in Nigeria which can be considered to still be at the early majority stage.

2.2.2. Endogenous Growth Theory

Endogenous growth theory which was established by the contributions of [8, 22] and [16] in extant literature assumes that the long term growth of the economy is primarily driven by the internal factors within the economy which includes technical and technological knowledge, human capital and innovation. The theory in line with the tenets of other contribution in literature assumes that economic growth captures the total productivity of a country in terms of goods and services. Therefore, an improvement in human capital and technological innovation will definitely spur the rate of production within the economy thereby stimulating growth. This theory was further proved empirically using the popular Cobb-Douglas function which placed emphasis on capital investment and labour as drivers of economic growth [9]. This theory is therefore relevant to the evolution of financial technology in any economy because of the relevance of money, money transfers and finance to the economy.

Apparently, the exchange of goods and services in the modern and contemporary era is majorly facilitated by money and finance. Therefore, the emergence of financial technology

which can ensure seamless and more secured financial transactions within the economy including the facilitating of commerce and international trade is a major aid to economic productivity. However, these is first internal to the economy and when properly established by the monetary authorities within the economy, it may foster economic productivity.

2.3. Empirical Literature

In Asia, [21] examine the impact of financial technology on inflation and unemployment between 2011 and 2017. The study used unemployment and inflation rates as the dependent variable and use of internet, debit card, mobile money and FDI as independent variables. The study used the Generalized Least Squares technique for analysis revealing that Fintech has positive effect on monetary policy effectiveness by reducing inflation and unemployment. In China, [13] examined the effect of financial technology on the effectiveness of monetary policy transmission between 2011 and 2018. The study used real GDP, inflation, loans and house prices as measures of monetary policy transmission while the usage of the fintech platform – Alipay as well as distance to the fintech hub city were used as measures of financial technology. The panel Vector Auto Regression (VAR) technique was used for analysis and it was discovered that FinTech adoption has a negative effect on monetary policy adoption.

In China, [14] examined the effect of digital financial development on the effectiveness of monetary policy between 2011 and 2020. The study used GDP as the dependent variable while digital finance as measured by transaction penetration rate, consumption level, fiscal policy, Coronavirus (COVID-19) were used as independent variables coupled with the spatial panel model analysis. The study revealed that digital finance had negative effect on monetary policy effectiveness. Thus, it was recommended that monetary policy should be reinforced to accommodate digital finance regulations. In Africa, [24] studied the effect of digital technology usage on economic growth of 39 African countries between 2012 and 2016. The study used real GDP as the dependent variable and also used Network readiness index (NRI) as the measure of digital technology. The Generalize Method of Moments (GMM) technique was used for analysis revealing that digital technology has a positive effect on growth.

In Indonesia, [23] studied the effect of financial technology on the effectiveness of monetary policy between 2009 and 2018. The study used inflation rate as the dependent variable and also used financial technology as proxied by the ratio of electronic money and outstanding money as independent variable. The Vector Error Correction Modelling technique was used for analysis revealing that fintech has positive effect on monetary policy effectiveness as an increase in fintech adoption decreases inflation. In 25 developed countries, [17] studied the impact of fintech on monetary policy effectiveness between 2001 and 2018. The study used output gap as the dependent variable while mobile technology, internet tech-

nology, cryptocurrency assets and financial development index as were used as independent variables. The GMM technique was used for analysis revealing fintech is a significant determinant of monetary policy effectiveness.

3. Data Source and Description

In this study, the scope of the study is limited to a span from 2012 to 2022 as a result of limited data such as other POS and mobile money data which is only provided up to 2022 from 2012 by the Central Bank of Nigeria. Hence, this renders the study scope a span of 10 years. As a result, the Ordinary Least Square (OLS) technique was used for empirical analysis in the

study. Also, it is pertinent to note that the study had some limitations in terms of data as consolidated data for cryptocurrency transactions, gift-card transactions and other fintech related transactions which regulators consider to be threat to the existing monetary system are not readily available on a year-on-year basis on most crypto-related websites.

Model Specification

The model adapted for this study was taken from the study of [21]. Although, the study model deviates from the adapted model due to the inclusion of some independent variables such as Bitcoin (BTC) price, mobile money transaction value among others. Hence, the model is stated hereunder as:

$$INF = \beta_0 + \beta_1 BTC_t + \beta_2 ATMT_t + \beta_3 POST_t + \beta_4 MMOT_t + \mu \quad (1)$$

Where:

INF – Inflation; BTC – Bitcoin Closing Price; ATMT – ATM Transaction Volume; POST – POS Transaction Volume; MMOT – Mobile Money Transaction Volume.

Furthermore, it is important to note that the data for inflation is obtained from the world bank database while the data for BTC is obtained from BitBo website.

4. Results and Discussions

Presentation of Results

Table 1. OLS Result.

Variable	Co-Efficient	Std. Error	Prob.
BTC	0.006873	0.055962	0.9063
ATMT	0.910064	0.468730	0.1002
POST	-0.062554	0.220370	0.7861
MMOT	-0.087925	0.144032	0.5640
C	-13.26952	7.618558	0.1322
R-Squared	0.771651		
Adj. R2	0.619418		
F-Stat.	5.068891		
Prob. (F-Stat.)	0.039471		
D*W Stat.	1.829237		

*, **, *** signifies significance at 10%, 5% and 1% respectively

Table 1 which presented the OLS result of the study revealed that all the independent variables in the study measuring Fintech had no significant impact on monetary policy effectiveness as measured by inflation rate.

Discussion of Findings

The study examined the impact of Fintech disruption on monetary policy effectiveness in Nigeria. The empirical analysis conducted in the study revealed that Fintech disruption had no significant effect on monetary policy effectiveness in Nigeria. Specifically, the price of BTC was found to exert a insignificant effect on inflation. This implies that an increase in BTC will have no effect on the general price level within the economy. This is probable as the general citizenry within the economy cannot even afford BTC at the moment because the minimum wage of the country is far below \$100 while a large percentage of the population still live below the poverty level (\$1 a day). Therefore, even when there is an increase in price of BTC, the larger chunk of the population may not likely be able to afford it in their portfolio therefore not even impacting the real spend of such vast majority of people. Furthermore, another tenable explanation for the insignificance of BTC price on the inflation rate within the Nigeria economy is the disconnect between the BTC ecosystem and the real economy in Nigeria. BTC is not recognized in Nigeria as fiat currency yet. As a result, in a bid to spend BTC, it must be converted into Naira. Unfortunately, it is usually a difficult task to get BTC converted to fiat currency (Naira) within the country except via Peer-to-Peer (P-2-P) platforms which therefore now brings such transactions within the control of monetary authorities because the P-2-P platforms eventually secure fiat payments into bank accounts in exchange for cryptocurrency thereby bringing such transactions under the money supply umbrella of the CBN after exchange.

Also, ATM, POS and Mobile Money transactions were found to exert insignificant effect on inflation. This implies that an increase in these transactions will not affect inflation or the effectiveness of monetary policy. This is equally possible as these channels are all various expressions of one phenomenon – money supply. These channels are medium of getting money across to the economy. As such, if money supply is properly regulated in the economy in tandem with the economic realities such as inflation and interest rate, more or less use of ATM, POS and Mobile money may not affect

inflation as they all provide money supplied in the economy. These are channels that will provide no money if there is no supply of money in the economy which means on their own volition may not affect inflation or the effectiveness of monetary policy even though they are Fintech initiatives. Therefore, based on this analysis, the study will rather consider them to tool of financial inclusion which brings the monetary system close to the “man on the street” rather than tools of monetary policy effectiveness as they have been considered in the study to wield insignificant effect in this regard.

5. Conclusion and Policy Implications

The study examined the effect of financial technology disruption on monetary policy effectiveness in Nigeria between 2012 and 2022. The study measured monetary policy effectiveness via inflation rate as the rate of inflation within the economy remains a major pointer to the effectiveness of the monetary policies of the government. Also, as measures of financial technology, BTC price, volume of ATM, POS and mobile money transactions were used as independent variables in the study. The OLS technique was used for analysis in the study and it was reported that fintech disruption has no significant effect on monetary policy effectiveness in Nigeria. Therefore, it is recommended that a synergy should be created between the Fintech ecosystem and the monetary system in Nigeria via a single encompassing reporting framework covering all the various components of Fintech system in Nigeria including cryptocurrency.

Abbreviations

FinTech	Financial Technology
BTC	Bitcoin
DeFi	Decentralized Finance
InsurTech	Insurance Technology
KYC	Know Your Customers
AML	Anti-Money Laundering
ATM	Automated Teller Machines
POS	Point of Sale
CBN	Central Bank of Nigeria
OLS	Ordinary Least Square
API	Application Programming Interface
P-2-P	Peer-to-Peer
COVID	CoronaVirus
NRI	Network Readiness Index
VAR	Vector AutoRegression
GMM	Generalized Method of Moments
GDP	Gross Domestic Product

Conflicts of Interest

The authors confirm that there is no potential conflicts of interest.

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