

Impact of Allocative Efficiency on Digital Credit in Nigeria

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Abstract: *This study examined the relationship between digital credit and allocative efficiency in Nigeria using three key variables: credit to the private sector, total e-payment value, and the number of internet subscribers. The central question guiding the study was whether increased activity within Nigeria's rapidly expanding digital financial sector has been associated with deeper credit intermediation to the productive private sector. While the broader literature treated digital credit in relation to financial inclusion, algorithmic scoring, consumer protection, and productivity, this study deliberately narrows its empirical focus to a simple and measurable macro-financial relationship that can be tested using official secondary data. The study adopted a quantitative time-series research design based on annual Nigerian data for the period 2018–2024 obtained primarily from the Central Bank of Nigeria (CBN) Statistical Bulletin and related CBN financial sector tables. Telecom connectivity data was sourced from the National Bureau of Statistics (NBS). Credit to the private sector was used as the dependent variable because it reflects the extent to which financial resources flow to the productive private economy. Total e-payment value proxied the scale and penetration of financial digitalisation, while internet subscribers proxied the spread of the digital infrastructure required for platform- based and app-enabled finance. The analytical methods used for the research were descriptive statistics, trend analysis, correlation analysis, and ordinary least squares regression. Logarithmic analysis and growth rate assessments were then applied to strengthen the results. The study proposes that digital finance can be beneficial for allocative efficiency, depending on how much it reduces transaction costs, overcomes the issue of information asymmetry, and opens up new ways of delivering formal financing services to entities that would have been left out otherwise. At the same time, the body of work highlights that digitalization alone will not guarantee productive financing if poor infrastructural setup, lack of trust, poor digital literacy, and poor design of digital financial products make it difficult to take advantage of the digital tools available (Aggarwal, 2021; Sam-Abugu et al., 2025). Through focusing only on three specific variables, the study provides an empirical approach to determine whether digitalization and improved internet usage are linked to credit performance in the Nigerian private sector.*

Keywords: digital credit, allocative efficiency, credit to private sector, total e-payment value, internet subscribers

INTRODUCTION

Digital credit has increasingly become a key component in the Nigerian economic landscape as a result of fast-paced growth of mobile apps, digital credit institutions, agent networks, payment mechanisms, and analysis techniques. In practice, the phenomenon involves transformation in initiating, conducting, and recording of transactions, as well as changes in lender approaches to client identification, attraction, and servicing (Berg et al., 2020; Fuster et al., 2022). Research suggests that these trends may have implications not only for financial inclusion, but also for the process of allocating resources, as they may allow reducing transaction costs, producing data trails, and creating additional access points for underbanked users (Berg et al., 2020; Fuster et al., 2022).

Meanwhile, digital activities in the financial landscape have been experiencing faster growth compared to conventional credit penetration. Channels for conducting electronic payments have been expanding rapidly, internet finance has been gaining increased importance in business and daily activities, and platforms have become crucial components of routine financial operations. Yet, this growth in digital transactions does not automatically imply an equivalent growth in financing to productive agents in the economy. While the country may observe growing digital payments and higher connectivity, its private sector may face insufficient, costly, or uneven access to financing (Linarello et al., 2022; Iwedi, 2024).

In this regard, the current research focuses specifically on the issue at hand rather than on all the dimensions of digital finance. It is concentrated on three variables which are measurable, interrelated conceptually, and available as formal data. Credit to the private sector will be used as the outcome variable in consideration of the size of formal finance inflows into the economy. Total value of electronic payments will be taken as the digital finance variable, as it measures the extent of transactional activity on formal digital platforms. Finally, number of internet subscribers will be adopted as the digital infrastructure variable, as internet usage expands technical reach of finance-related activities (Linarello et al., 2022; Iwedi, 2024). Thus, these three variables form a solid empirical base for discussing whether deeper digitalisation is associated with faster credit growth in Nigeria. This choice was made, in part, to solve an important methodological issue associated with this kind of studies. Most of the existing literature discusses the issue of digital credit in emerging economies in broad terms. Authors cover topics such as financial inclusion, response patterns, adoption barriers, equity considerations, and general development effects, thereby providing a wealth of conceptual material on the subject. These discussions have merit in themselves, but the present research requires a much narrower focus that could easily be justified, measured empirically, and discussed. Therefore, the current paper opts for internal consistency and uses a dependent and two independent variables, which corresponds to three objectives outlined below.

Although there is evidence of considerable development in the Nigerian digital financial space, there is no empirical basis upon which to confirm whether the digitalization has led to deeper credit intermediation in the private sector. The increased use of e-payments, fintech diffusion, and online financial products have been generally positively appraised by policymakers and industry stakeholders. But increases in digital financial activities do not necessarily mean the expansion of credit and improved financial allocative efficiency. Digitalization might improve transaction

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facilitation and increase financial visibility without an equivalent expansion of credit to the private sector due to persistent lending barriers, unequal access to the Internet, or when the bulk of digitalization occurs in the sphere of payments, rather than credit creation (David-West et al., 2022; EFInA, 2024).

Another problem with existing research is that it often deals with the topics of financial inclusion, usage, and adoption but not whether digital finance indicators can affect credit outcomes. There are many papers about mobile money, fintech adoption, digital payments, or digital literacy; however, only a few try to establish the relationship between digital finance indicator variables and credit. In other words, it is still uncertain whether digitalization has had an impact on credit. Moreover, the topic is especially pertinent for Nigeria where digital financial services have developed under conditions of inadequate infrastructure, geographical inequality, issues of trust, and changing regulatory framework (Adeleke & Alabede, 2022; Jalal-Eddeen, 2025).

Finally, another limitation is related to measurement challenges. It is well known that digital finance encompasses a number of factors, each of which is quite hard to capture longitudinally due to the lack of statistical collection of platform-lending data and their publication in annual reports. Therefore, this study will rely on secondary data and select the closest observables that can affect credit through digital finance. Specifically, total e-payment value and internet subscribers will be chosen as the independent variables, whereas credit to the private sector will act as the dependent one. On this basis, the study will examine the relationship between these variables. The general objective of this paper is to analyse the linkages between some selected digital finance indicators and credit to the private sector in Nigeria. Specifically, the study aims at:

1. analysing the effect of total e-payment value on credit to the private sector in Nigeria.
2. assessing the effect of internet subscribers on credit to the private sector in Nigeria.
3. evaluating the joint relationship among total e-payment value, internet subscribers, and credit to the private sector in Nigeria.

The study is important theoretically, empirically, and politically. From a theoretical point of view, the study makes a contribution to existing research by elaborating on the nexus between digital finance and financial intermediation and allocative efficiency through developing a concise three-variable model based on financial soundness indicators. The paper will demonstrate that by considering credit to the private sector, total e-payment value, and internet subscribers, it is possible to design an analytical framework that can back up the idea of promoting better financial intermediation through the development of digital systems (Berg et al., 2020; Linarello et al., 2022).

On an empirical level, the study will prove its significance in terms of providing data on indicators that can be traced by means of official sources and without any need to resort to private platforms' statistics. Furthermore, the case study will show the approach to formulating a concise problem and turning it into an empirical model with the use of descriptive statistics, trends analysis, correlation coefficients, and regression techniques. Therefore, the study can serve as a useful tool for conducting similar studies in the future.

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Politically, the findings of the study will be important for regulators, banks, and development organizations. If digital-finance indicators are proven to be positively linked with credit to the private sector, then the hypothesis that deeper digital finance results in better financial intermediation will become even stronger. Otherwise, there is every reason to conclude that mere transactions and connectivity cannot make a difference and need to be complemented with other factors to lead to successful intermediation. This way, the study will contribute to interpreting events in the digital financial sphere and making public policies. The study will be limited geographically to Nigeria and will cover the period of 2018-2024 that had the most consistent availability of annual secondary data on the variables. Also, the study will be conducted based on only three variables (credit to the private sector, total e-payment value, and internet subscribers), will not seek to control other determinants of credit, and will not investigate the performance of individual lending algorithms. The same applies to platform-level loans performance, household welfare effects, and algorithmic justice which fall outside the substantive scope of the study.

LITERATURE REVIEW

This study's relevant literature is classified into three interdependent constructs: credit to the private sector as an indication of the allocative scope of formal finance; total e-payment value as an indicator of digital finance activity; and internet subscribers as an indicator of digital connectivity. The choice of three variables is deliberately made for obvious reasons, and therefore the current literature review is not meant to cover the entire fintech or digital finance literature. Instead, emphasis will be laid on theoretical and empirical research that explains how and why digital transaction depth and digital connectivity can influence the outcomes of private-sector credit arrangements in Nigeria and similar developing countries.

Conceptual Review

Credit to the private sector can be defined as the total volume of financial resources lent by banks and other formal financial institutions to economic agents from outside the public sector. It is frequently used in macroeconomic studies as a measurement of financial intermediation. In this study, credit to the private sector is chosen as a dependent variable because it shows the penetration level of the formal financial system into the production sector of the economy. The growth of this variable could imply deeper penetration into the private economy but whether it is development-related or not depends on whom the credit goes to and under what conditions (Linarello et al., 2022).

Total e-payment value means the total monetary amount of transactions conducted in digital financial channels. Contrary to pure transaction counts, this variable shows how large these digital transactions are in terms of financial size. In the current study, total e-payment value is seen as an indicator of digital finance intensity. Higher levels of electronic payment transactions mean that more economic activity takes place digitally and thus, formal transactions become easier to track down and make easier to conduct. In addition, better financial transparency could have positive implications for credit decisions (Fuster et al., 2022; Iwedi, 2024). Internet subscribers are the total number of existing active internet connections. As such, this variable is a reflection of the infrastructure necessary for digital

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finance to go further beyond brick-and-mortar banks and financial institutions. Through the internet, one can enjoy all kinds of financial services, including managing accounts remotely, using apps, sending transactions and receiving alerts, participating in platform-based lending, and communicating with customers. In this study, internet subscribers are used as enablers for digital finance activities and are not expected to have a direct effect on private-sector credit (David-West et al., 2022).

The link between the selected variables is clear. In simple terms, credit to the private sector is the dependent variable, and the total number of transactions in digital payment channels – total e-payment value – is considered as one of the determinants of credit allocation. At the same time, the number of internet subscribers is seen as one of the enablers of this process.

Conceptual Framework

The study uses the following basic conceptual model to show how the selected digital finance indicators impact credit allocation in Nigeria. The basic idea is that credit to the private sector (CPS) is the dependent variable and that total e-payment value (EPAYVAL) and internet subscribers (INTERNETSUBS) are independent variables.

This model assumes that growth in the volume of total e-payment value mirrors an increase in the depth of digital financial transactions, expansion of electronic transaction access points, and development of the payment system. As digital payments expand, financial institutions are better able to observe transaction trails, reduce information asymmetry, and improve financial intermediation. This can contribute to higher levels of formal credit extended to the private sector.

The framework also assumes that increase in the number of internet subscribers represents increase in the level of digital connectivity and level of accessibility of on-line financial services. As the rise in internet access makes it easier for firms and households to use digital banking services, mobile money and transaction platforms, and credit and credit related services. Also, internet availability makes it easier for firms and households to establish digital profiles that can potentially increase their credit assessment scores and availability of loans. Therefore, an increase in internet access should be associated with the rise in the ratio of credit to private sector.

In this study, the ratio of credit to private sector is used as a proxy for allocative efficiency since it is an indicator for the extend in which the formal financial services are accessed by productive economic agents. Therefore, the framework assumes that the ratio of credit to private sector is expected to rise with increased amount of digital payment activity and improved internet connectivity.

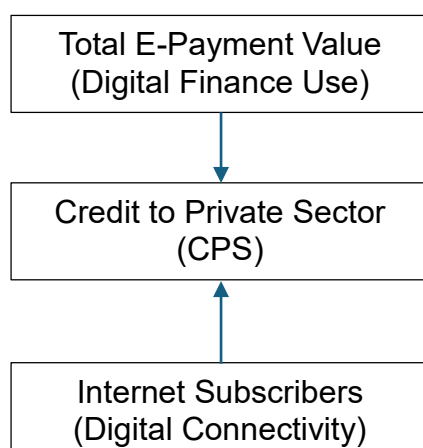


Figure 2.1: Conceptual Framework

Theoretical Review

Financial intermediation theory is the first theoretical foundation for this study. According to this theory, the financial system performs critical functions associated with savings mobilization, screening of borrowers, information processing, and resource reallocation. The more effectively functioning a financial system is, the easier credit flows are delivered to productive private actors, thus facilitating investments and the overall economic activity. Under this assumption, digital payments matter because they facilitate transaction processes associated with financial intermediation by providing greater economic activity formalization and lower fund transfers costs (Linarello et al., 2022).

The second theoretical foundation is the information-friction theory. It argues that credit markets suffer from information asymmetry as lenders have lesser information than borrowers concerning projects' quality, borrowers repayment ability, and the financial behaviour of borrowers. The use of digital systems could overcome such informational friction by generating increased amount of information trail as well as higher levels of economic activity transparency. For example, Berg et al. (2020) prove that digital footprints can supplement or substitute the credit information for predicting borrower risk. Also, Fuster et al. (2022) explain how machine learning and digital information influence credit allocation. Although this study is not based on modelling an algorithmic credit scores mechanism, this theory inspired it to use total e-payment value as a measure of transaction volume which can aid improvement of informational environment for formal financial services.

The third theoretical foundation is digital infrastructure theory. Digital financial services depend on digital infrastructure, which includes devices, internet connection, digital platforms, and interconnected systems. In the absence of these infrastructure, even the most efficient digital solutions would lack scalability or accessibility for a wide number of people. The internet connection plays a particular role here as it opens new opportunities and lowers geographical constraints on services provision. In the context of Nigeria, it is important because digital development took place at different paces and unevenly across the country's regions and population, implying that connectivity is an important facilitator for the availability of digital financial products (Adeleke & Alabede, 2022; David-West et al., 2022).

Overall, the three theories propose a possible mechanism through which the research variables are connected. First, the higher e-payment volume indicates a higher level of activity and better information environment provided by digital transactions. Second, the larger number of internet subscribers is suggestive of improved connectivity, representing a greater availability of the necessary infrastructure for using digital services. Finally, such factors could positively impact the private sector credit outcomes. However, there is no necessity in the existence of such a deterministic mechanism. Digital systems may increase payments faster than loans, and vice versa, whereas infrastructure

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improvements could take place despite poor credit intermediation. Thus, the relationship needs verification empirically.

Existing verifiable evidence argue that digital finance could expand formal finance outreach, facilitates transactions, and makes users better visible to financial organizations. Specifically, Berg et al. (2020) highlight that digital footprints are useful for credit scoring, especially of credit-challenged entities. Similarly, Fuster et al. (2022) show how digital data and machine-learning systems influence the structure of credit markets, impacting loan approval and pricing. Even though the findings are not only related to Nigeria, these studies support the hypothesis that a high digital environment might significantly contribute to credit intermediation.

Nigeria-related evidence contributes to this argument, too. First, David-West et al. (2022) conclude that mobile money adoption and innovation in this area were hindered by issues of mistrust, lack of interconnections among players, and unstable policy framework. Adeleke and Alabede (2022) identify unequal financial inclusion across socio-economic and geographic groups. Iwedi (2024) shows that digital infrastructure contributes to the growth of commercial banking firms in Nigeria. Altogether, the findings suggest that digital development leads to better financial outcomes, yet the effects of such developments depend significantly on context.

The evidence from across Africa shows that digital indicators are key to predicting financial results. For example, Umar et al. (2024) observed the positive effect of digital finance on SME financial inclusion in Africa. Additionally, Yeyoumo et al. (2023) noted the significant consequences of fintech development for gender disparities in financial inclusion in sub-Saharan Africa. Although neither of these studies considered the dependent variable of this study, both papers emphasized that digital systems impact the structure of financial services delivery. Building on that evidence, this study tested the effects of the chosen variables on private sector credit in Nigeria.

At the same time, the existing literature advises against taking any automatic positive association for granted. Specifically, Aggarwal (2021) warns about potential risks associated with algorithmic and data-driven finance, such as inequalities, privacy breaches, and loss of customers' freedom. In addition, Sam-Abugu et al. (2025) state that financial literacy remains an essential factor contributing to financial inclusion in Nigeria. Jalal-Eddeen (2025) also identifies social problems that emerge when fintech lending grows in the absence of trust. These studies are significant in that they highlight that digital advancement could be related to not only greater scope of , creates some vulnerabilities. Thus, the present study assumes the neutral position by exploring the associations between the chosen variables without any assumptions regarding their benefits.

Literature Gap

There are two important gaps in the existing literature on the topic under discussion. Firstly, although there are many studies focusing on digital inclusion, digital platform use and its convenience, financial behavior, and other aspects, relatively little scholarly work was done to explore the macroeconomic relationship between digital finance indicators and credit to the private sector. In other words, whether the observed growth in digital transactions or connectivity led to increased formal credit access in Nigeria is unclear.

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Secondly, many theoretical discussions about the relationship between digital finance and credit use broad narrative concepts or evidence on specific platforms, which complicates comparison between periods. In addition, publicly available annual statistics on digital lenders are frequently lacking in terms of comprehensiveness or consistency, causing serious difficulties for comparison. Therefore, the paper bridges the gap by developing a simple three-variable model based on official annual secondary data, thus providing a clear empirical methodology for analysing the chosen topic.

METHODOLOGY

Methodologically, this study adopted a quantitative approach utilising annual time-series data from Nigeria for the period 2018-2024. A quantitative research approach is well suited to research of this nature with goals that necessitate the measuring and statistical analysis of connections between well-established variables. In addition, it is appropriate for this research seeking to advance discussion beyond mere description to offering an objective estimation of the extent to which the selected indicators have any connection with private-sector credit results.

The decision to utilise annual secondary time-series data was based on practical and analytical considerations. From the practical perspective, officially published annual time-series data enables the tracking of variables consistently throughout time. From the analytical perspective, annual data assist in mitigating short-term fluctuations, therefore making them ideal to identify structural trends and relationships instead of high-frequency market dynamics. The period 2018-2024 is specifically selected to account for the fast development of digital finance in Nigeria, including the growth of its utilisation during the COVID-19 pandemic period and the subsequent adaptations in the financial system after 2020. Data for credit to the private sector and total value of e-payments were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and financial sector data tables, while data for internet subscribers were taken from the National Bureau of Statistics (NBS) telecommunications indicators. Data from official sources were preferred since they offered the advantage of greater consistency, clarity, and repeatability compared to reports provided by various platforms and credit bureaus.

In line with data availability within the context of Nigerian digital finance, official data from CBN and NBS are utilised to form the primary dataset. While fintech reports and credit bureau publications offer helpful contextual information, they do not provide annual balanced time-series data necessary to the study. Therefore, these sources are used exclusively for the background discussion, while the econometric analysis relies on data from official institutions to ensure a high level of consistency between research objectives, variables, and methodology.

The analysis in this study focuses on three major variables. Private sector credit (CPS) is defined as a dependent variable, and it is intended to measure the degree of credit intermediation in the productive private economy. Total value of e-payments (EPAY_VAL) is defined as an independent variable, serving as a proxy of monetary volume of digital finance operations. Internet subscribers (INTERNET_SUBS) is the other independent variable, which is seen as a proxy indicator of digital infrastructure enabling platform-based financial services. Variables for this study are chosen in accordance with its objective. CPS is expected to reflect overall credit outcomes, suggesting stronger allocative reach of the financial system. On the other hand, EPAY_VAL will help to capture the extent

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of activity in digital finance that cannot be captured by transaction frequency alone. As for INTERNET_SUBS, it will help to proxy the level of internet penetration, which would enable customers to gain access to various financial services. The chosen variables are interpretable, measurable, and consistently available for the entire study period.

The robustness of this model is enhanced further with the incorporation of transformations, such as logarithms, growth rates, and ratios. Such transformation is necessary to ensure robustness of the model and but is not a replacement for the variables themselves. Logarithmic transformation accounts for non-linear growth and scale differences, while the latter allows conducting growth-rate analysis, helping to see whether the relationships still hold after accounting for year-to-year change in data.

Overall, the relationship among the variables can be formulated as follows:

$$CPS = f(EPAY_VAL, INTERNET_SUBS)$$

In other words, credit to the private sector is a function of total value of e-payment and number of internet subscribers. To conduct empirical analysis, the study utilises a baseline regression model of credit to the private sector:

$$CPS_t = \beta_0 + \beta_1 EPAY_VAL_t + \beta_2 INTERNET_SUBS_t + \mu_t$$

Where CPS_t is credit to the private sector at time t ; β_0 is the intercept term; β_1 and β_2 are the slope coefficients; t is the subscript denoting time period and μ_t is the stochastic error term.

To account for the difference in scale between the two variables and to allow for elasticity estimation, the log-linear regression is also calculated as a robustness check:

$$\ln(CPS_t) = \alpha_0 + \alpha_1 \ln(EPAY_VAL_t) + \alpha_2 \ln(INTERNET_SUBS_t) + \varepsilon_t$$

Logarithmic transformation is especially important when dealing with variables that display trend growth and significant scale differences. Such transformation helps to stabilise variance and allow for estimation of coefficients as elasticities.

From the theoretical point of view, the sign of β_1 is expected to be positive. Growth in total e-payments can be indicative of an advanced digital finance environment, including higher financial inclusion and formalisation, along with improvements in informational efficiency. On this basis, increased volume of total e-payments should lead to growth in credit to the private sector.

The sign of β_2 should also be positive. More widespread use of internet can indicate advanced digital infrastructure and better access to various fintech services and remote payments. However, the effect and statistical significance of such variables is a matter for empirical investigation.

The empirical analysis is started with the use of descriptive statistics and trends to establish the nature of relationships between the variables. Descriptive statistics summarise central tendency, dispersion, minimum, maximum, and general behaviour of variables during the study period. Trend analysis is then conducted to identify any upward or downward movements of variables or other patterns observable through time. This stage of analysis allows getting a first impression regarding how variables behave together. Subsequently, correlation analysis is conducted to investigate the strength and nature of pairwise linear relationship among them. Regression analysis based on ordinary least squares (OLS) method is used to quantify the extent to which total value of e-payments and internet subscribers influence credit to the private sector. Given that the data sample is relatively small for annual time series data, OLS is an effective and easy way to analyse the proposed model. Robustness

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of the model is additionally tested with the use of logarithms and growth rate calculations. While they are considered as part of the robustness analysis and not distinct analyses, these techniques help to evaluate the sensitivity of main results to alternative but reasonable representations of the selected variables. With the help of log-linear model, one can overcome the issue with variable scale and estimate elasticity. On the other hand, growth rate checks help to determine whether any relationships observed at levels are still valid after shifting focus on year-to-year change.

Estimated coefficients will be interpreted according to their direction, magnitude, and statistical significance. Positive coefficients show that an explanatory variable and private sector credit move in the same direction, whereas negative – the opposite direction. Significance will be measured with the help of p-values, whereas goodness of fit will be assessed with the help of coefficient of determination (R^2).

All results are presented with the use of descriptive tables, trend charts, and interpretative analysis. This presentation technique is consistent with the study's objectives, helping to examine the findings in a clear and transparent way. Finally, this technique will assist in critically analysing whether findings support the broader argument that there is positive association between private-sector credit and digital deepening in Nigeria.

RESULTS AND DISCUSSION

In this analysis, we will explore the factors driving credit to the private sector (CPS). Credit to the private sector will be considered as the dependent variable, whereas total e-payment value (EPAY_VAL) and internet subscribers (INTERNET_SUBS) will act as explanatory variables. Following the standard procedure in data filtering, this analysis uses the 2018–2023 sample because the 2024 telecom data represent partial data.

Methodologically, the analysis follows a descriptive statistics and trend analysis approach and proceeds to correlation analysis, followed by OLS regression analysis, and log-transformed growth rates as robustness tests.

Table 4.1 presents the dynamics of the variables under analysis for the period from 2018 to 2023. The data shows that credit to the private sector attained a mean value of ₦22.83 trillion, with values ranging from ₦13.97 trillion (minimum) to ₦39.80 trillion (maximum). The total value of electronic payment grew by leaps and bounds in the specified period, increasing from ₦138.90 trillion to ₦2,117.35 trillion, resulting in a mean value of ₦900.70 trillion over the period under review. The internet subscriber base also experienced continuous growth from 106.42 million to 163.84 million. Clearly, digital financial deepening grew faster than bank-based credit growth.

Table 4.1: Descriptive statistics of the study variables (2018–2023)

Variable	Mean	Median	Std. Dev.	Min	Max
Credit to private sector (₦ trillion)	22.828	20.282	9.46	13.965	39.797
Total e-payment value (₦ trillion)	900.703	757.693	792.712	138.901	2117.352

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Internet subscribers (million)	141.243	148.136	21.491	106.421	163.838
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Figure 4.1 below presents the three variables as index numbers, with 2018 taken as the base year (2018 = 100). Two broad patterns emerge from the figure. First, all three variables follow an upward trajectory over the study period, pointing to a general increase in both financial deepening and digital connectivity. Second, total e-payment value increases at a much faster rate than credit to the private sector and internet subscribers, with the gap becoming especially noticeable from 2020 onward. Credit to the private sector also rises steadily, though at a slower rate than e-payment value. Internet subscriptions, by contrast, grow more gradually, experiencing a slight decline in 2021 before resuming their upward movement. Taken together, these trends suggest that digital financial activity expanded significantly during the period and may have contributed to creating favourable conditions for broader credit intermediation.

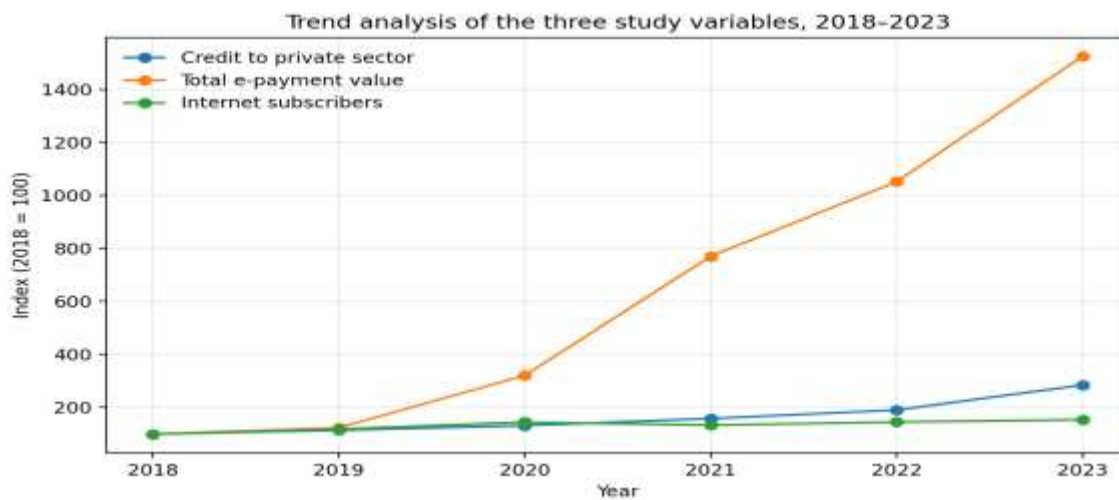


Figure 4.1: Indexed trend of the three variables (2018 = 100)

Table 4.2 below shows the Pearson correlation matrix. Credit to the private sector is very strongly and positively correlated with total e-payment value ($r = 0.971$) and moderately to strongly correlated with internet subscribers ($r = 0.777$). The correlation between total e-payment value and internet subscribers is also positive ($r = 0.785$). These coefficients suggest that the variables move together in the expected direction. Correlation alone, however, does not establish causation; for this reason, the regression analysis that follows is used to estimate their partial relationships.

Table 4.2: Correlation matrix for the study variables (2018–2023)

Variable	Credit to private sector	Total e-payment value	Internet subscribers
Credit to private sector	1.0	0.971	0.777
Total e-payment value	0.971	1.0	0.785
Internet subscribers	0.777	0.785	1.0

Table 4.3 (below) presents three OLS estimates. Model 1 is the baseline level regression for the strict full-year sample (2018–2023). Model 2 re-estimates the relationship in log-linear form so that the

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coefficients can be interpreted as elasticities. Model 3 uses annual growth rates as a robustness check on whether short-run changes in digital-finance indicators track short-run changes in credit to the private sector.

Table 4.3: OLS regression results for credit to the private sector

Variable	Model 1: Levels	Model 2: Log-linear	Model 3: Growth rates
Constant	10.295	-0.963	0.346
Total e-payment value	0.0112 (p=0.025)	0.298 (p=0.115)	-0.080 (p=0.630)
Internet subscribers	0.000000 (p=0.872)	0.114 (p=0.913)	-0.436 (p=0.626)
R-squared	0.943	0.877	0.222
Observations	6	6	5

The baseline estimates reported in Model 1 indicate that total e-payment value has a positive and statistically significant relationship with credit to the private sector. The coefficient of 0.0112 suggests that, holding internet subscriptions constant, a ₦1 trillion increase in total e-payment value is associated with an increase of about ₦0.011 trillion in credit to the private sector, or approximately ₦11.2 billion. The model accounts for 94.3 per cent of the variation in CPS over the 2018–2023 period. In contrast, the coefficient on internet subscribers is positive but not statistically significant, implying that digital access alone does not explain private-sector credit once the depth of digital transactions is taken into account.

The robustness checks qualify, but do not overturn, this central finding. In the log-linear specification (Model 2), the coefficient on the logarithm of total e-payment value remains positive (0.298), indicating that a 1 per cent increase in total e-payment value is associated with an estimated 0.30 per cent increase in credit to the private sector. Although this elasticity coefficient is not statistically significant at the 5 percent level (possibly because of the small number of observations), it has the same sign as the baseline coefficient. The coefficient in the equation that uses internet subscribers is also positive, but it also remains statistically insignificant.

As can be seen from the results above, Model 3 produces very weak results. Both coefficients remain statistically insignificant, and the goodness of fit falls dramatically from 0.919 in the baseline model to 0.222 in Model 3. These results suggest that the substantive relationship in question is better explained in levels than growth rates.

To test the robustness of our findings, the level model was estimated using the whole sample from 2018 to 2024, but without changing anything else. The total e-payment value still showed a statistically significant ($p = 0.001$) and positive effect on CPS (coefficient = 0.0119), whereas internet subscribers proved to be statistically insignificant in the multivariate analysis. The goodness of fit was also high in this full sample model with an R^2 of 0.977. Therefore, one can conclude that exclusion of the partial data for telecom sector in 2024 does not substantively influence the results obtained.

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From the above results, it can be concluded that the variable of digital finance that is more relevant in explaining the variations in CPS is the total e-payment value. Although the number of subscribers is essential as it determines the potential user base, e-payment value measures the amount of transactions that occur in the digital ecosystem. Accordingly, the implication of these results is that the deeper and more active the use of digital finance in Nigeria, the higher the level of credit deepening.

The results also support the broader argument of the study. A more active digital payments ecosystem may reduce transaction frictions, strengthen information trails, and improve the environment within which lenders allocate credit to the private sector. At the same time, the absence of statistical significance for internet subscribers in the multivariate models cautions against interpreting digital inclusion purely in infrastructural terms. This suggests that policy should focus not only on expanding internet access, but also on deepening the effective use of digital finance in ways that support productive credit intermediation.

It should be noted that these results are to be interpreted cautiously considering the small number of observations used in annual sample estimations. Nonetheless, they confirm the conclusions made previously using descriptive statistics and correlation techniques.

CONCLUSION AND RECOMMENDATIONS

Digital credit has emerged as an increasingly significant innovation within Nigeria's changing financial landscape. Its relevance stems from the capacity of the innovation to bridge informational gaps, cut down costs associated with transactions, and extend financial services to those individuals and entities that remained beneath the reach of established channels of borrowing. In theory, digital credit seems to constitute a promising tool for improving allocative efficiency. This is confirmed by the findings obtained throughout the literature review herein. The reviewed sources indicate that digital finance could promote financial accessibility, improve credit assessments, and facilitate productive lending among those that could hardly obtain a loan otherwise. However, the case of Nigeria demonstrates that these benefits of digital credit do not emerge automatically. They rely heavily on how digital credit works in practice.

The main conclusion drawn from this research is that digital credit is capable of boosting allocative efficiency in Nigeria. However, it is only able to do that if the process of lending is mediated responsibly. The benefits of digital credit become apparent if it is provided to financially viable borrowers at relatively affordable rates in an appropriate manner. When this is the case, digital credit could prove helpful in addressing funding gaps, facilitating productive activities, and enhancing the role played by formal intermediaries in supporting enterprise development. Also, digital finance enables extending formal finance to those who were considered unprofitable, inaccessible, and/or expensive to lend money before.

However, the reviewed studies emphasised that digital expansion should not be equated with development. In other words, the rapid spread of lending through smartphones and other devices does not necessarily lead to enhanced allocation and productivity. Specifically, if digital lending is driven by non-transparent scorecards, poor consumer protection, excessive fees, short tenors, and aggressive recovery mechanisms, its contribution to allocative efficiency could be minimal. Where that is the case, digital lending then merely allows financially vulnerable people to survive rather than invest,

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grow their businesses, and generate income regularly. This is of significant importance to Nigeria where digital finance is currently developing in a landscape characterised by infrastructural, technological, and socio-economic disparities. That is why it should be noted that it is not the rapid growth and extensive outreach of digital credit that matter in this case. Rather, it is about achieving positive outcomes.

With that said, this study offers three recommendations to policymakers in Nigeria.

To begin with, regulators should keep on reinforcing the existing framework of responsible digital credit in Nigeria. Because undoubtedly, the expansion of digital credit has brought about significant benefits, but it has also increased the risks associated with the provision of such financial services via smartphones and similar technologies. In view of this, regulation should look beyond just increasing access, and address issues of pricing transparency, data protection, fairness, consumer rights, and algorithmic accountability. Borrowers should be fully aware of what kind of loans they receive, what terms apply to the repayment of debts, and what criteria lenders utilize when making their decisions. This would make it possible to build a responsible credit market that benefits borrowers, lenders, society, and the economy.

Furthermore, policymakers should focus on measures that go beyond digital inclusion, i.e. registered accounts, wallets, or user numbers. Even though these figures can provide valuable insights into the development of digital finance in the country, they however, cannot show, for certain, whether digital finance brings tangible benefits for the economy. Therefore, it is necessary to pay special attention to the productive use of digital credit services, especially the impacts on enterprise activities, business investment, employment, household resilience, and general development outcomes. From a practical standpoint, this means that measuring digital credit should go beyond volume of its usage, and focus on its use leads to productive outcomes in the country and helps foster financial intermediation to determine its success.

Finally, digital credit should be supported by various complementary factors in order to produce long-term benefits. In other words, access to credit is especially valuable if it is supplemented by other factors (e.g. skills, infrastructure, and market opportunities) necessary for productive use. In this regard, it would be more beneficial for public and private sector players to combine digital lending with initiatives concerning financial literacy, digital capabilities, agent networks, market access, and industry-specific value chains. After all, digital credit is often most beneficial if it is applied under circumstances that will enable repayment and productive investments. Without these appropriate complements, digital credit might stimulate borrowing without increasing productivity or economic welfare.

Overall, this study reveals that digital credit should not be regarded as a magic bullet that automatically solves all the problems related to financial exclusion. On the contrary, it should be viewed as a financial and institutional tool that requires careful implementation and support from the side of policymakers. Indeed, it is the quality of regulation, the inclusivity of infrastructure, the nature of product design, and the capabilities of borrowers that determine its productive value. This viewpoint is significant as it diverts focus from just reliance on digital tools and technologies only and points it towards relevant economic and institutional conditions that determine whether digital credit fosters productive activities.

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To sum it up, digital credit appears to offer considerable opportunities to Nigeria; but these opportunities are conditional and not automatic. Even more, digital credit has been proven capable of contributing to efficient financial resource allocation and enterprise development. However, these benefits of digital credit can only be attained if development is accompanied by transparency, trust, appropriate regulation, and borrower capability.

The key takeaway of the study therefore is that policymakers should assess digital credit primarily according to its productive use rather than rapid expansion. This way, regulatory decisions, institutional protections, and real-world conditions that influence the application of the technology will have a greater influence on the future worth of digital credit in Nigeria than the technology itself.

Suggestions for Further Studies

Future studies on digital credit in Nigeria should look pass general narratives on financial inclusion and concentrate more on assessing if digital credit really promotes allocative efficiency. While some existing studies highlight increasing digital financial activity in Nigeria, there still exists no clear evidence on the extent to which such increment is accompanied by more efficient use of financial resources. To overcome this limitation, future researches should pay much attention to collecting firm-level panel data connecting digital borrowing to outcomes like sales, hiring, inventory management, firm survival rates, and overall enterprise productivity. These type of data will facilitate better assessment of whether digital credit actually contributes to businesses growth and productive investment.

Also, future research in this field should stop relying only on national data and start looking at more detailed, localized research. Breaking down data by state and industry would show if areas with higher digital credit use actually have better small business growth, fewer wasted resources, and better overall performance compared to areas where digital credit is in short supply.

This is especially relevant for Nigeria, where infrastructure, income levels, internet access, and market conditions vary wildly from one place to another. While national studies provide a big picture, they often hide these crucial local differences.

Furthermore, future researches need to look deeper into *why* people are taking out digital loans. Instead of just tracking usage, we need to know if they are borrowing to invest in a business (productive use) or just to pay for daily essentials and emergencies (survival). Knowing this difference will show us if digital credit is actually helping people grow or just helping them stay afloat.

Additionally, there is need to look closer at the ethics and fairness of digital lending. Future research should focus on how these loans affect different groups, especially women and people in rural areas, and fix issues like unfair automated decisions, hidden costs, and aggressive debt collection.

Mixed methodology combining qualitative and quantitative analysis is also recommended. Interviews with participants could help identify why some people manage to improve their economic situation owing to digital credit whereas others continue borrowing and experiencing debt-related problems.

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