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# Digital Payment System and Economic Growth in Nigeria: A Longitudinal Study (2012 – 2024)

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**Abstract**
The increasing adoption of digital payment systems has significantly transformed financial transactions worldwide, including in Nigeria. This study investigates the impact of digital payment platforms—Point-of-Sale (POS) systems, Automated Teller Machines (ATMs), web payments, and mobile payments—on economic growth in Nigeria from 2012 to 2024. Using the Autoregressive Distributed Lag (ARDL) model, the study examines both short-run and long-run relationships between digital payment transactions and real Gross Domestic Product (RGDP). Findings reveal that digital payment systems positively influence economic growth, with mobile payments having the strongest impact. The results suggest that the adoption of cashless payment methods enhances transaction efficiency, improves liquidity, and boosts economic activities. Despite initial challenges such as low financial literacy and infrastructural deficits, digital payments have contributed to the country's financial inclusion and economic expansion. The study recommends national awareness campaigns, financial literacy programs, and improved infrastructure to enhance the efficiency and reliability of digital transactions. The study recommends adoption and efficiency of digital payment systems, public awareness campaigns, government collaboration with financial institutions for training, and improved infrastructure.The study recommends adoption and efficiency of digital payment systems, public awareness campaigns, government collaboration with financial institutions for training, and improved infrastructure.

**Keywords:** Digital Payment Systems, Economic Growth, Financial Technology, Cashless Economy, JEL

## Introduction

Over sixty years ago, most consumers relied on cash or cheques to purchase goods and services, with cash mainly used for smaller transactions and cheques for more expensive purchases. In some parts of the world, cash is still the predominant method of payment, although it has become less common overall due to the convenience offered by general card payments. As of today, credit and debit cards have been a blessing to consumers and businesses to conduct transactions easily, electronic payment systems can even be made using various devices, from wristwatches to phones (Moody,2016). Due to the era of digitalization in the financial sector in the world, most bank transactions have transformed digital payment systems as a key driver of this revolution, a new way to handle transactions by businesses and improve customer experiences (Subramanyam et al., 2024).

In today's times, the production of products and services is significantly shaping due to technological innovation. The advancement in technology spans across various sectors and industries, including finance. The measurement of products and services is no longer assessed based on utility, but also on efficiency, convenience, and delivery speed. According to Mustapha (2018), digital payment systems are viewed as the latest development in many developing countries. Recent theories on economic growth propose that innovation and technological progress can generate positive ripple effects across the economy, potentially fostering growth. Although it's too soon to fully understand the practical implications of these theories, nations such as Nigeria, India, and other digitally advanced countries exemplify how digitalization might play a pivotal role in driving growth. Moreover, these theories highlight the significance of enhancing factors that support the digital economy and society (Anirudh & Pavel, 2022).

In Nigeria over the years, digital payment systems have gained prominence significantly, leading economic agents to prefer conducting monetary transactions without visiting traditional brick–and–mortar banks (Oginni et al., 2013; CBN, 2021). This system has steadily garnered user acceptance, resulting in consistent growth in cashless transactions over the years, despite initial problems identified (Nkwanko, 2013). With the growth, successful implementations and progress of digital payment systems in Nigeria, researchers and policymakers

have raised several questions. Can digital payments be successful in an emerging economy like Nigeria, which is characterized by low–income groups, low levels of computer and financial literacy, a large informal sector, and a high volume of cash-based transactions? The question requires an exploration of how digital payment platforms, including Point-of-Sale systems, Automated Teller Machines, web payments, and Mobile payments, influenced economic growth in Nigeria between 2012 and 2024.

**Schumpeter's Theory on Finance and Development**

Schumpeter (1911) established a relationship between finance and development, emphasizing that economic growth is influenced by technological innovations that reduce economic uncertainty. This theory highlights the role of financial sector agents in fostering technological advancements and financial services while supporting financial intermediaries in evaluating business risks and project management.

**Theory of Finance and Its Role in Economic Growth**

It recognized the importance of the financial sector in stimulating economic growth and development. To unlock growth in an economy, there is a need to develop the financial sector. According to Levine (2005), the effect of information and transaction costs can be reduced due to the existence of financial instruments and financial markets. The long-run growth rate will be influenced by interest rate, saving rate, decision on investment and technological innovations due to changes in incentives, problems facing economic agents.

**New Growth Theory**

This theory asserts that economic growth results from human desires for continuous improvement. It emphasizes the role of entrepreneurship, innovation, knowledge, and technology as key drivers of economic expansion (Hodagho, 2016). Saidi (2018) suggests that growth in e-payment channels stems from increased digital transactions, making digital payments an endogenous source of economic growth.

According to Abass (2022) on the effect of the digital payment system on economic growth in Nigeria. Quarters 1 and 2 of 2010 were used. The outcome shows the presence of long-run relationships and short-run relationships among the variables. Both the short-run and the long-run coefficients reveal that all the variables are significantly and positively related to economic growth. It then recommended the implementation of a policy of capital punishment for misuse of payment platforms in the country. Anirudh and Pavel (2022) discuss how the gradual decline of paper in favor of digital payments has garnered the interest of consumers, institutions, and businesses. Their paper examines has digital payments have had any impact on the Czech Republic's economy. By using a linear multiple regression model covering 2015 to 2020. Findings reveal that while digital payment systems do have an impact, it is not substantial enough to warrant a complete transition to or increased usage of such payment systems. This may be due to the limited availability of transactional value data for digital payments. Accessing more extensive data could reveal the actual consumer demand for digital payment products among consumers, leading to an increased supply. Aligned with Aldaas's (2021) study on the impact of electronic payment transactions on economic growth from 2014 to 2018. It employed the use of regression techniques, and the results show that there is the existence of association between electronic payment systems and economic growth.

The study explores the effects of the digital payment system on micro , small and medium enterprises(MSMEs) in Blitar City, Indonesia ,based on a survey of 4797 MSMEs. It highlight how challenges related to usage ,value, and risk significantly contribute to functional barriers. Moreover, traditional and image-related obstacles also intensify these functional barriers. However, the study found that functional barriers do not have a notable impact on the actual adoption of digital payments (Annah et al., 2022).

Investigation on the relationship between cashless policy and economic growth in Nigeria. The data range from 2008 to 2015 with the use of an ordinary least squares method (OLS). The outcome reveals, POS, Web payments, and the use of Mobile payments are positively related and statistical influence on growth. Adoption of non–cash payments will reduce inflation and unemployment rates and later raise economic growth (Yusuf, 2016). Examining the factors affecting the growth of Micro, Small, and Medium Enterprises (MSMEs) in India with data collected through a primary source questionnaire. The findings show digital payments system is contributing to the growth of MSMEs in India. The study recommended that policymakers encourage MSMEs to use digital banking (Bharat et al., 2020). According to Tee and Ong( 2016) examined impact of cashless payment on the economic growth of five European Union countries- Austria, Belgium, France, Germany, and Portugal using data from 2000 to 2012 and employing a co-integration and error correction model. The result discovered a long- run significant effect of espousing cashless payment on economic growth in all these countries. They realized that a policy that promotes cashless payment won't have an immediate effect on the economy. Efanga et al. (2020) in probing the impact of electronic payment systems on economic growth in Nigeria. Data range from 2009 to 2018 and cover variables like POS outstations, ATM outstations, and web payment as delegates for electronic payment systems, while economic growth is represented by real GD P


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growth. ARDL styles were espoused and the outcome shows the actuality of a positive relationship between electronic payment systems and economic growth over the studied period.

**Methodology**

The study examines the influence of digital payment system on Nigeria economic growth from 2012 to 2024. The selected variables proxies to measure digital payments in Nigeria are transaction values of Point of payment (VPOS), transaction values of Automated Teller Machine (VATM), the transaction values of Web payment (VWEB), and the transaction values of Mobile Payments (VMOB). The Real Gross Domestic Product (RGDP) is used as a measure of economic growth**.**

The model can be specified as:

RGDP = F(VPOS, VATM ,VWEB,VMOB) ……. (1).

RGDP = $\alpha_0 + \alpha 1 VPOS + \alpha 2 VATM + \alpha 3\ VWEB + \alpha 4\ VMOB$ ……..( 11 ) .

RGDP = Real Gross Domestic Product.

VATM = value of an Automated Teller Machine payment system,

V POS = value of Point of the Sales payment system.

VWEB = value of web payment system and

VMOB= value of the mobile payment'

**Results**

**Table 1: Descriptive Statistic Result**

| Variables | RGDP | VPOS | VATM | VWEB | VMOB |
|---|---|---|---|---|---|
| **Mean** | 17,58711 | 236,176 | 1,364,117 | 13365321 | 736957.1 |
| **Max** | 20896324 | 1,536,311 | 5,024,311 | 1.30E+ 06 | 6007505 |
| **Std.Dev** | 1,878,325 | 414,321 | 1,205,141 | 24.461325 | 1,296296 |
| **Skewness** | -0.17325 | 1.137411 | 1.567113 | 2.468515 | 2.497361 |
| **Kuitosis** | 2.31576 | 3.215176 | 4.77321 | 7.3813225 | 8.267187 |
| **Jaq.Berra** | 0.93654 | 11.53611 | 28.75415 | 72.78615 | 85.3769 |
| **Prob** | 0.65367 | 0.006315 | 0.0000001 | 0.000000 | 0.000000 |

**Source: Author's Computation.(2025).**

A positive skew indicates that the distribution has a long tail to the right, meaning the data contains some larger minimum values. The advanced the value, the further the data is disposed. VPOS, VATM, VWEB, and VMOB all show positive skewness, indicating that these variables have a long right tail (i.e., some extremely high values). The kurtosis values of VATM, VWEB, and VMOB are veritably high, suggesting that these variables have heavy tails and that extreme values are more common than a normal distribution would prognosticate. The RGDP variable appears the closest to normal with a skewness near zero and a Jarque- Bera p- p-value lesser than 0.05( indicating no strong substantiation against normalcy). On the other hand, the VPOS, VATM, VWEB, and VMOB variables show significant substantiation against normalcy, as indicated by their veritably low Jarque- Bera test chances.

**Table 2: Estimation of Unit Root Test (PP)**

| Variables | Levels | | Ist Difference | | Decision |
|---|---|---|---|---|---|
| | **Adj.stat** | **Prob** | **Adj.stat** | **Prob** | |
| **RGDP** | -5.481336 | 0.0004* | - | - | 1(0) |
| **VPOS** | -3.687815 | 0.0200* | - | - | 1(0) |
| **VATM** | -2.587588 | 0.4361 | -16.76875 | 0.0000* | 1(1) |
| **VWEB** | -1.543645 | 0.6586 | -6.435877 | 0.0000* | 1(1) |
| **VMOB** | -3.387765 | 0.0732 | 9.065778 | 0.0000* | 1(1) |

**Source: Author's Computation. (2025).**

The table provides outcomes of unit root test using Phillips- Perron (PP) system, which helps determine whether a time series is stationary or non-stationary. Due to the order of integration in which RGDP and VPOS are 1(0) and VATM, VWEB, and VMOB are 1(1) order of integration, it'll be suitable enough to employ the use of the ARDL Model for estimating the short- run and long- run relationship among the variables.


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**Table 3: Estimation of ARDL Test**

| **Null Hypothesis:** | **No Long Run Relationship** | |
|---|---|---|
| **T. Statistics** | **Value** | **K** |
| **F-Statistics** | 6.534512 | 4 |
| **Critical Value Bounds** | | |
| **Significance (%)** | **10 Bounds** | **11 Bounds** |
| 10 | 2.46 | 3.55 |
| 5 | 2.77 | 4.02 |
| 2.5 | 3.24 | 4.48 |
| 1 | 3.75 | 5.07 |

**Source Authors computation.(2025).**

From the table at the 10 significance position, the F-statistic (6.534512) is advanced than both the 10-bound (2.46) and 11-bound (3.55) and implies the existence of the long-run relationship. At 5% significance level, F-F-statistic is also greater than both the 5 10- bound (2.77) and 11- bound (4.02), suggesting the same conclusion - there's presumably a long-run relationship. While at the 2.5 and 1 significance situations, also F-statistic is lower than the critical values at both significance situations. Since F- F-statistic (6.534512) lower than the critical value bounds at all significance levels, we reject the null hypothesis. The conclusion shows the existence of long- run relationship among the variables in the model.

**Table 4 Estimation of Co-integration and VECM Test.**

| **Variables** | **Co- efficients** | **Std. Er** | **t-Stat** | **Prob** |
|---|---|---|---|---|
| **RGDP(-1)** | -.0270615 | 0.13647 | -2.15637 | 0.0487** |
| **RGDP(-2)** | -0.2790467 | 0,12566 | -2.86554 | 0.0077* |
| **RGDP(-3)** | -0.3413111 | 0.13321 | -2.74134 | 0.0150** |
| **RGDP(-4)** | 0.525155 | 0.14133 | 4.073115 | 0.0008* |
| **VPOS** | -0.137659 | 0.05321 | -2.671327 | 0.0146** |
| **CPOS(-1)** | 0.081726 | 0.032415 | 2.322565 | 0.0217** |
| **VPOS(-4)** | -0.033648 | 0.021113 | -1.613669 | 0.0377** |
| **VATM** | 0.071325 | 0.036644 | 2.030122 | 0.1037 |
| **VATM(-1)** | -0.058845 | 0.035133 | -2.077371 | 0.0626*** |
| **VWEB** | 0.011719 | 0.009259 | 1.321877 | 0.2542 |
| **VWEB(-4)** | -0.0136005 | 0.007611 | -2.065366 | 0.00665*** |
| **VMOB** | 0.046870 | 0.033111 | 2.311327 | 0.0221** |
| **CintEq(-1)** | -1.473615 | 0.356351 | -4.156366 | 0.0005* |

**Source Authors computations.(2025).**

The analysis using co-integration and Vector Error Correction Model (VECM) focuses on relationships and adjustments among economic variables. Co-integration identifies long-term connections between variables, indicating they move together over time despite short-term fluctuations. Variables like RGDP and VPOS show significant impacts on the system, highlighting their role in economic equilibrium. Others, like VATM, display weaker effects, possibly pointing to less stability or influence. The Error Correction Term reveals a strong mechanism for returning to equilibrium after disruptions.


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**Table 5: Estimate of the Long – Run.**

| Variables | Coefficients | Std .Error | t-Stat | Prob |
|---|---|---|---|---|
| **VATM** | -0.063411 | 0.02355 | -2.60536 | 0.0096 * |
| **VPOS** | -0.0432156 | 0.01248 | -3.48536 | 0.0039* |
| **VWEB** | -0.0056715 | 0.002511 | -1.76533 | 0.0861*** |
| **VMOB** | 0.096182 | 0.015305 | 6.877421 | 0.0000* |
| **C** | 17.3625 | 0.205788 | 56.368156 | 0.0000* |

**Source: Author's Computation.(2025).**

The estimate of the short- run model shows that the portions of VATM and VMOB are both appreciatively statistically related at a 5 level of significance. This implies that ATM and VMOB have a positive influence on economic growth. The measure of POS is appreciatively and statistically significant after 4 lags at a 10 significance position. The long run estimate of ATM.POS and MOB are related. ARDL outcomes in the short and long run are positively related with significant effects on economic growth in Nigeria.

**Discussion**

The results reveals digital payment systems such as point of sale (POS), automated teller machines (ATMs), web payments, and mobile payments have significantly influenced economic growth in the short and long run. ARDL model results confirm a positive relationship between these variables and real gross domestic product (RGDP), with mobile payments showing the strongest impact.

**Conclusion**

The study concluded that digital payment system has grown steadily in the country despite initial challenges as cash dominated economy. Existence of the growth reflects increased efficiency in transactions, enhanced liquidity, and improved consumer convenience, contributing to broader economic development.

**Recommendations**

1) There is a need for national campaigns to educate people about the benefits and use of payment platforms.
2) The government should partner with financial institutions to offer training programs on secure digital transactions.
3) There is a need for a stable power supply and expanded internet facilities to enhance the reliability of mode of digital payment system.

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