

DOI: 10.17747/2618-947X-2026-1-20-34



# E-Commerce Development Strategy in Nigeria's Economy: Empirical Evidence from the Konga and Jumia Platforms

A.N. Omeje<sup>1</sup>  
O. Stumke<sup>1</sup>  
D.O. Ezeogo<sup>2</sup>  
R. Rena<sup>1</sup>

<sup>1</sup> Durban University of Technology (Durban, South Africa)

<sup>2</sup> University of Nigeria (Nsukka, Nigeria)

## Abstract

Nigeria is home to Africa's second-largest e-commerce market. This growth has been driven by innovations in technology, logistics, and online payment systems. This study investigates the impact of e-commerce on the Nigerian economy using Konga and Jumia as case studies. The autoregressive distributed lag (ARDL) model and monthly time-series data for the period 2017M1–2023M12 were employed. The results reveal statistically significant short- and long-run effects of e-commerce on the Nigerian economy through the activities of Konga and Jumia. Specifically, the number of users conducting transactions on Konga and Jumia, telecommunication investment in both the short and long run, and the number of internet users in the short run were found to have a statistically significant effect on Nigeria's economic growth. The study recommends that the government increase investment in telecommunications and improve internet access in order to stimulate e-commerce development, expanding digital trade both domestically and across borders, and promote economic growth.

**Keywords:** ARDL model, internet users, economic growth

## For citation:

Omeje A.N., Stumke O., Ezeogo D.O., Rena R. (2026). E-Commerce Development Strategy in Nigeria's Economy: Empirical Evidence from the Konga and Jumia Platforms. *Strategic Decisions and Risk Management*, 17(1): 20-34. DOI: 10.17747/2618-947X-2026-1-20-34.

# 尼日利亚经济中电子商务发展战略: 基于Konga和Jumia平台的实证证据

A.N. Omeje<sup>1</sup>  
O. Stumke<sup>1</sup>  
D.O. Ezeogo<sup>2</sup>  
R. Rena<sup>1</sup>

<sup>1</sup> 德班理工大学 (南非德班)

<sup>2</sup> 尼日利亚大学 (尼日利亚恩苏卡)

## 摘要

尼日利亚是非洲第二大电子商务市场。该市场的增长得益于技术、物流和在线支付领域创新的应用。本文以 Konga 和 Jumia 平台为例, 分析电子商务对尼日利亚经济的影响。研究采用自回归分布滞后模型 (ARDL), 并使用了 2017 年 1 月至 2023 年 12 月期间的月度数据。研究结果表明, 电子商务, 特别是 Konga 和 Jumia 平台, 在短期和长期内都对尼日利亚经济产生了统计显著影响。对尼日利亚经济增长具有统计显著影响的因素包括: 在 Konga 和 Jumia 平台上进行商业交易的用户数量、电信行业投资 (无论在短期还是长期) 以及互联网用户数量。基于研究结果, 建议政府加大对电信行业的投资并扩大互联网覆盖范围, 这将有助于促进电子商务、国内和跨境贸易以及经济增长。

**关键词:** ARDL 模型, 互联网用户, 经济增长

## 引用格式:

Omeje A.N., Stumke O., Ezeogo D.O., Rena R. (2026). 尼日利亚经济中电子商务发展战略: 基于Konga和Jumia平台的实证证据. 战略决策与风险管理, 17(1): 20-34. DOI: 10.17747/2618-947X-2026-1-20-34.

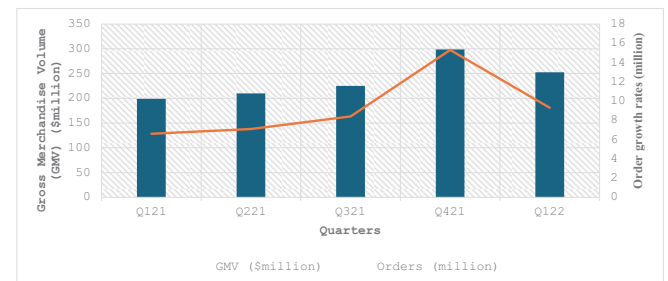
## Introduction

The world has increasingly become a global village, where information technology (IT) plays a crucial role in the functioning of the globalized economy [Asogwa, 2013]. The growth of information technology has been widely recognized as influencing economic development either directly or indirectly [Toader et al., 2018]. Consequently, e-commerce has emerged as one of the most prominent applications of information technology. It encompasses methods used in the purchasing, selling, and exchanging of goods and services through computer networks and the Internet, and it has significantly transformed global economic systems [Bitrus, 2019].

E-commerce is crucial for every economy [Bitrus, 2019]. The level of economic growth in a country can, to some extent, be reflected in its response to the development of e-commerce [Oladimeji, Folayan, 2018]. For developing countries in particular, e-commerce has been identified as a significant driver of economic growth, and Nigeria is not an exception [Oladimeji, Folayan, 2018]. Gradually, e-commerce has begun to exert a notable influence on the trading system of national economies. For instance, the COVID-19 pandemic demonstrated that the importance of e-commerce for inclusive economic growth cannot be overstated. During this period, virtual shopping, also known as e-commerce, became one of the most common methods of purchasing groceries, household appliances, mobile devices, electronics, and other products [Janet, 2021].

With revenues of approximately \$6.9 billion in 2021, Nigeria ranked 33rd globally in e-commerce engagement, ahead of Denmark and behind Colombia. The Nigerian e-commerce market grew by 30% in 2021, contributing significantly to the global growth rate of 15%. As a result, Nigeria recorded approximately \$12 billion in online transaction volume in 2021. In Nigeria, Jumia and Konga were the leading e-commerce platforms during

this period. With operations in more than 14 African countries, Jumia is the most widely recognized e-commerce platform in Nigeria. The platform offers a wide range of products, including children's items, home appliances, clothing, electronics, and other products, all of which can be delivered to customers' homes or workplaces. Jumia, a pioneer of Nigerian e-commerce founded in 2012 by Sacha Poignon, Raphael Kofi Afaedor, and Tunde Kehinde, generated approximately \$22 million in revenue in 2021. By 2024, its revenue had reached approximately \$286 million, with projected revenue of about \$284 million in 2025. Jumia has given Nigeria's digital industry international recognition, thereby increasing foreign direct investment (FDI) and the sector's contribution to gross domestic product (GDP). In global rankings of internet engagement in business transactions, Jumia was ranked 1,503rd in 2020 and improved to 874th place by 2024. It also became the thirteenth most popular website in Nigeria<sup>1</sup>. Figure 1 illustrates the growth in the number of Nigerians using Jumia for business transactions, measured by order growth rates and gross merchandise volume.



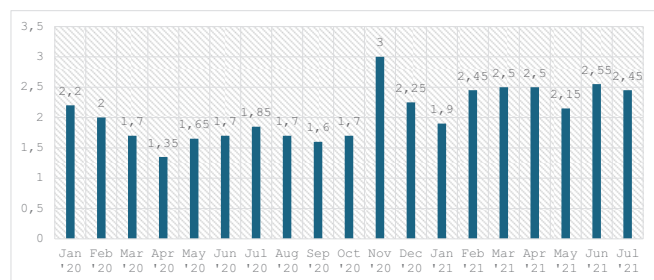
Source: authors' computation using available data from Jumia, 2023.

**Fig. 1. Order Growth Rates and Gross Merchandise Volume (GMV) on Jumia from 2021Q1–2022Q1**

<sup>1</sup> Jumia Company & Revenue 2014-2026. Ecdb.com. <https://ecdb.com/resources/sample-data/retailer/jumia>.

Figure 1 indicates that although the number of Nigerians using Jumia for business transactions is increasing, Nigeria has not yet fully capitalized on the opportunities embedded in the e-commerce value chain through this platform. This may be attributed to limited funding, insufficient awareness of business opportunities in the sector, and the government's inability to provide an adequate enabling environment. Through the empowerment of micro, small and medium enterprises (MSMEs), Jumia has significantly contributed to the Nigerian economy. Over the years, the company has provided a marketplace for producers, distributors, and retailers—most of whom are MSMEs—to offer their products and services to consumers. Jumia has also reduced waiting times through its logistics services, which enable merchants to ship and deliver goods efficiently, as well as through its payment services that facilitate interactions among market participants. As a result, Jumia's contribution to economic growth cannot be overstated. By reducing costs associated with marketing, leasing, and operating physical stores, Jumia has improved the viability of MSMEs and contributed to broader economic growth.

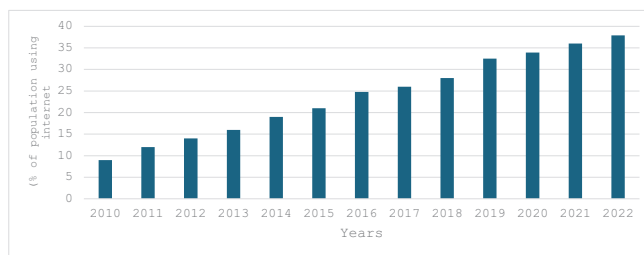
Similarly, Konga plays an important role in promoting inclusive online retail in Nigeria. Konga is among the largest online marketplaces in the country. Founded in 2012 by Sim Shagaya, the company offers a wide variety of products, including personal care items, mobile phones, clothes, shoes, healthcare products, books, home appliances, baby products, computers, and other products. Figure 2 shows that as of July 2021, Konga recorded approximately 2.5 million visits globally, 90% of which originated from Nigeria.



Source: authors' computation using available data from Statista, 2023.

**Fig. 2. Konga Monthly Number of Visits from 2020M1–2021M7 (mln)**

E-commerce activities in Nigeria have expanded significantly due to increasing investment in telecommunications services [Okolie, Ojomo, 2015]. In addition, the growth of e-markets has further strengthened e-commerce activities in the country. Consequently, the number of individuals accessing the Internet increased considerably between 2010 and 2021, recording growth of approximately 73% in recent years. Figure 3 presents the percentage of individuals using the Internet from 2010 to 2022.



Source: authors' computation using available data from Trading-Economics, 2023.

**Fig. 3. Individuals Using the Internet (% of Population) in Nigeria from 2010 to 2022**

Figure 3 indicates that the percentage of Internet users in Nigeria increased steadily from 2010 to 2022, reaching approximately 37.9% in 2022. As the twenty-first century progressed, numerous start-ups emerged within the digital economy, many of which target Nigeria's rapidly expanding base of Internet users. At present, Jumia and Konga remain the most prominent e-commerce platforms in Nigeria [Okolie, Ojomo, 2015]. Prior to the emergence of e-commerce, in the economy, consumers faced numerous constraints in traditional business transactions. Traders encountered supply chain bottlenecks, information asymmetry arose due to the presence of intermediaries, and market research required significant time and resources. At present, web-based companies such as Jumia and Konga have become new intermediaries that connect producers and consumers more efficiently.

Information technology has therefore become a key driver of global e-commerce activity. Internet services enable businesses to conduct transactions across national borders regardless of time zone differences. However, the expansion of e-commerce requires reliable technological infrastructure and stable Internet access, which remain limited in Nigeria. Nevertheless, Nigeria has been ranked as the largest and one of the fastest-growing ICT markets in Africa, as well as one of the ten fastest-growing telecommunications markets globally [Oladimeji, Folayan, 2018; Ogbonne et al., 2021]. Between the introduction of Global System for Mobile Communication (GSM) services in 2001 and 2021, the telecommunications sector contributed more than \$70 billion to Nigeria's GDP. Innovation in ICT and increasing public awareness have strengthened the sector's role in economic development<sup>2</sup>. According to Nigerian Communications Commission (NCC), the telecommunications sector accounted for 7.7% of GDP in 2012 and increased to 14.3% by the second quarter of 2020<sup>3</sup>. With the exception of a slight decline in 2013, the contribution of telecommunications to GDP remained relatively stable between 2012 and 2020. According to the data, telecommunications contributed 7.7% of GDP in 2012, 7.4% in 2013, and 7.6% in 2014. In 2015, the sector's contribution increased to 8.5% of GDP, followed by 9.13% in 2016. In 2017, telecommunications accounted for 8.7% of GDP, rising to 9.9% in 2018 and 10.6% in 2019. By the second quarter of 2020, the sector's contribution increased to 14.3% of GDP, equivalent

<sup>2</sup> Development of Best Practices in Information Infrastructure Security Management (2021). Nigerian Communications Commission, Department of New Media and Information Security: 1-134. <https://ncc.gov.ng/market-data-reports/publications>.

<sup>3</sup> Ibid.

to N2.3 trillion, while the overall contribution of the information and communication technology (ICT) sector reached 17.5% during the same period [Olalekan, 2013]. Information and communication technology (ICT) supports the development of the e-commerce sector by creating employment opportunities, automating processes, and enhancing transparency in various economic activities.

Despite these benefits, the expansion of e-commerce in Nigeria still faces significant challenges. Limited penetration of information technology and the persistence of the digital divide remain major obstacles to the development of the Nigerian e-commerce market [Duncombe, Heeks, 2005]. In Nigeria, there are substantial obstacles preventing the expansion of high-speed Internet access. These obstacles include the legacy of operators investing in private network deployments, which is further exacerbated by poor infrastructure quality and a complex institutional framework responsible for overseeing and promoting the development of ICT infrastructure and the telecommunications sector. Given the high costs of infrastructure development and relatively low profitability, it is difficult to extend market boundaries deeper into underserved areas, which has resulted in market failures. The lack of innovative service offerings is further intensified by the high price sensitivity of the market. Another significant barrier to Internet access in Nigeria is the high cost of broadband-enabled devices for low-income households. Other demand-side constraints include low electrification rates, the lack of locally relevant digital content, and widespread digital illiteracy. Scholars [Duncombe, Heeks, 2005; Toader et al., 2018] have argued that, in order to promote inclusive e-commerce development in Nigeria, a robust digital ecosystem must be created, digital transformation accelerated, and the critical mass of Internet users significantly expanded. Achieving these objectives requires innovative solutions, carefully designed policy interventions, and substantial financial investments. By strengthening the foundations of the digital economy through an ecosystem approach, these measures could encourage the deployment of networks in underserved areas, contribute to the reduction of broadband costs, expand complementary public access to the Internet, and stimulate demand for digital services.

Another major challenge is the large digital literacy gap, which prevents many Nigerians from fully benefiting from e-commerce opportunities. Participation in e-commerce requires digital skills at multiple levels, ranging from basic user literacy to advanced technical capabilities among producers and service providers across industries. Customer loyalty, ease of access, lower operating costs, improvements in traditional market chains, access to niche markets, greater business efficiency, automation of processes, expansion of the customer base, improvements in customer welfare, and customer education are all factors that significantly support the development of e-commerce [Okolie, Ojomo, 2015]. However, several constraints continue to affect the growth of e-commerce in the Nigerian economy. These include concerns related to business privacy and confidentiality, unreliable network availability, high establishment costs, data protection and security risks, credit-card fraud, cybercrime, limited levels of education and income, inadequate technological infrastructure [Ayo, 2011; Okolie, Ojomo, 2015],

and concerns about safety in online environments [Omeje et al., 2022a]. Therefore, the primary objective of this study is to examine how e-commerce influences the Nigerian economy, using Konga and Jumia as case studies.

## 1. Literature Review

The literature review in this study considers both theoretical and empirical perspectives. The study first examines the theoretical literature, followed by empirical literature. These are discussed in the subsections presented below:

### 1.1. Theoretical Literature

The Diffusion of Innovations theory was developed by Rogers in 1962 [Rogers, 2003; Miller, 2015]. The theory explains how individuals adopt innovations and new technologies in order to perform routine activities more effectively. According to the theory, the key factors determining the adoption of innovations include relative advantage, compatibility, complexity, trialability, and observability [Rogers, 2003]. This theory focuses on the processes through which new technological ideas, methods, and artifacts move from creation to adoption and use. The fundamental concepts of the theory are based on technological innovations that diffuse over time through specific communication channels among members of a social system [Miller, 2015]. According to Rogers, any technological innovation passes through several stages: knowledge (awareness of its existence and understanding of its functions); persuasion (development of a favorable attitude toward it); decision (commitment to adopt); implementation (actual use); and confirmation (reinforcement based on positive outcomes) [Rogers, 2003; Miller, 2015].

The endogenous growth theory was developed in the 1960s with contributions from several prominent economists [Arrow, 1962; Romer, 1986; Lucas, 1988]. The endogenous growth hypothesis explains how internal forces influence long-term economic growth. It is based on the idea that improvements in human capital, knowledge, and innovation increase productivity and thereby contribute to economic growth. According to this approach, the system responsible for the production process determines long-term economic growth rather than external forces. While the theory extends the neoclassical framework by treating technological change as an endogenous outcome of public and private investments in human capital and knowledge-intensive industries (innovation), it maintains that technological advancement remains the primary driver of output growth. The endogenous growth model assumes a constant exogenous savings rate and an endogenous growth rate driven by technological progress. Technological innovation is typically represented by a factor (commonly denoted as  $A$ ). The production function in this model does not exhibit diminishing returns to scale. According to the endogenous growth theory, aggregate production can increase with scale. When investments in human capital (such as education), research and development, and infrastructure are low, the economic progress of developing countries may be constrained. It is therefore assumed that investments in human capital, infrastructure, health, telecommunications, and education generate higher productivity and external economies that help offset the expected tendency toward diminishing returns.

$$Y = AK^{a+b} L^{1-a}. \quad (1)$$

According to endogenous growth theory, technological progress plays a significant role in productivity growth because it drives technological change, which in turn depends on innovation and human capital that are internal to the economy.

## 1.2. Empirical Literature

This section examines studies related to the subject of the study. The empirical literature reviewed in this area is divided into foreign and domestic studies.

Some studies by [Alrawashedh et al., 2022] have investigated the effect of procedures and accounting systems on the performance of Jordanian e-commerce businesses. Quantitative data collection methods and descriptive research design were used in this study. The findings revealed that the accounting and financial performance of Jordan's e-commerce sector remains uncompetitive due to the lack of government financial support, low Internet usage rates, and numerous obstacles faced by e-commerce firms in generating profits within the Jordanian market. The study therefore recommended improvements in the country's banking and Internet systems. In a related study, the impact of e-commerce development on the labor market was examined [Banescu, Manea, 2022]. A panel regression model was employed using data from 28 European countries. The results indicated that the model explained approximately 99.5% of the variation in labor market activity rates among individuals aged from 15–64. The findings suggest that the growth of e-commerce and an increase in the share of technology-oriented human capital contribute significantly to higher labor market participation. The study recommended that governments support technological advancement in the labor market by restructuring educational systems and introducing new courses that enhance competitiveness and sustainable development.

The potential of e-commerce in propelling Russian economic expansion was examined by [Karpunina et al., 2021]. Variance, covariance, and correlation analysis were employed in the study. The results indicated that Russia's economic growth patterns were significantly influenced by the emergence of e-commerce. Additionally, the dynamics of e-commerce in Russia during the COVID-19 pandemic demonstrated a notable expansion of the industry, which marked the beginning of a new phase in the country's e-commerce development. [Ibiam et al., 2017] examined the impact of e-commerce in Africa, using Nigeria as a case study and applying an ex post facto research design. The study employed an ex-post facto research design. The findings showed that although e-commerce has benefited African economies, a major challenge affecting its effectiveness is the lack of trust in online transactions across the continent. The study concluded that investment in e-commerce infrastructure in Africa, particularly in Nigeria, would accelerate economic development on the continent.

Consumer expectations and perceptions of service quality across public, private, and international banks were compared in [Navrang, Meenu, 2018]. The SERVQUAL instrument was used to measure service quality in the private banking sector. The authors found that banks face numerous challenges as a result of technological change, persistent economic un-

certainty, intense competition, increasingly demanding customers, and evolving environmental conditions. The study therefore emphasized that customer satisfaction is essential for banks to remain competitive in the market. Further, the relationship between Chinese economic development and e-commerce integration was examined by [Couture et al., 2018]. The analysis combined a randomized controlled experiment (RCT) conducted in villages in collaboration with a major e-commerce company with survey data and administrative microdata. The results revealed significant benefits from e-commerce trading; however, these benefits accrued primarily to a small group of rural households, typically those that were relatively wealthier and younger. Furthermore, there was limited evidence of significant income increases for the average rural worker or producer. Instead, most benefits were observed on the consumption side, particularly in more rural markets where the cost of living declined. The authors therefore recommended further investments aimed at adapting e-commerce systems to rural communities, as the observed impacts were largely attributable to the removal of logistical barriers to e-commerce in rural markets.

Similarly, [Zatonatska, Novosolova, 2017] investigated the impact of e-commerce on Ukraine's economic growth. Economic, mathematical, and statistical estimation techniques were applied in the analysis. The results showed that e-business, although still in its early stages, has considerable growth potential, while e-commerce in Ukraine is expanding rapidly compared with many European markets. Regression analysis further revealed that electronic commerce has a significant influence on Ukraine's economic growth. The relationship between Poland's economic development and e-commerce has also been demonstrated through modeling. The comparison of models showed that Poland has a more developed e-commerce sector, although Ukraine's e-business sector is growing at a faster pace. In another study, the impact of e-commerce on the Indian economy was analyzed by [Anuj et al., 2018]. Using the Spearman rank correlation method, the study found that digital penetration in India has increased significantly, largely due to the growing use of smartphones. Internet usage in India has also increased, and the study found a relationship between the country's e-commerce growth and literacy rates. However, a negative association was observed between the expansion of e-commerce and unemployment. The study concluded that substantial government involvement and increased foreign direct investment (FDI) are necessary to sustain and expand India's e-commerce sector.

[Anjalika, Priyanath, 2018] examined the impact of commercial banks' service standards on customer satisfaction in public and private banks in Sri Lanka using survey data from 141 respondents and correlation analysis. The results indicated that, in public banks, there was a strong positive correlation between tangibility and customer satisfaction, as well as between responsiveness and customer satisfaction. Similarly, [Anvari, Norouzi, 2016] examined how the economic progress of 21 selected countries was influenced by e-commerce, research and development (R&D), and other variables. The study employed panel data and the generalized least square (GLS) regression technique for the period 2005–2013. The findings showed that both R&D and e-commerce have a positive and statistically sig-

nificant effect on GDP per capita based on purchasing power parity. Moreover, e-commerce was found to have a stronger effect on economic development than R&D. Government size and health expenditure were also found to positively influence GDP per capita.

Another study conducted by [Adisak, 2015] identified five consumer service factors influencing effective e-commerce service delivery in Thailand. Using quantitative methods and survey data, the study found that the most significant factors included service providers' commitment to protecting customer information, knowledgeable and competent bank staff, and banks' willingness to develop customer-related service capabilities. The relationship between service quality and customer satisfaction in the Malaysian e-banking and e-commerce industries was examined by [Tan et al., 2016]. Regression analysis and measuring tools such as SERVQUAL and SPSS were used in this study. The results indicated that Malaysian banking customers generally had higher expectations than perceptions regarding service quality, and the tangible dimension of service quality had the strongest influence on customer satisfaction. The study therefore emphasized the importance of maintaining high service quality standards.

In another related study, [Lili, Yan, 2014] examined the impact of e-commerce on China's economic growth. The study identified three major indicators of e-commerce development—the number of Internet users, the number of e-commerce enterprises, and the number of online shoppers—all of which were positively associated with GDP based on multiple regression analysis using the ordinary least squares (OLS) method. The study further suggested that the expansion of e-commerce significantly contributes to economic growth. It recommended that governments, businesses, and consumers prioritize e-commerce development by investing in infrastructure, employing more e-commerce professionals, and encouraging greater participation in online commerce. Another study examined the impact of China's cross-border e-commerce comprehensive pilot zones (CBCEPZs) on firms' innovation capacity [Zhang, Han, 2025] using a difference-in-differences (DID) model. The findings showed that the establishment of CBCEPZs significantly enhanced firms' innovation capacity, as evidenced by an increase in patent applications in emerging technological fields. Similarly, [He et al., 2026] examined the implications of regulatory innovation for digital platforms in China's data-intelligence era of e-commerce. Using a Chinese digital platform policy dataset covering the period 2000–2025 and a density-based Latent Dirichlet Allocation (LDA) algorithm, the study found that regulatory intensity was significantly correlated with both digital innovation and the value of e-commerce transactions, with statistically significant lag effects consistent with business adaptation and policy implementation.

The relationship between socio-economic development and e-commerce was also examined by [Boateng et al., 2008] using literature survey methods and descriptive statistics. The findings suggested that e-commerce has been spreading across developing countries and may contribute to achieving the global development agenda. The authors recommended that entrepreneurs, governments, consultants, and development agencies in developing countries prioritize policies that support the im-

plementation and adoption of e-commerce initiatives. Another study by [Ziaul et al., 2005] examined how e-commerce affects economic performance. The study found that e-commerce significantly influences business costs and productivity. E-commerce was found to differ from traditional forms of commerce by increasing efficiency through greater transparency. The study suggested that firms adopting e-commerce platforms must be prepared to allow suppliers and customers access to certain internal systems. An analysis of firms' responses to the environmental impacts of e-commerce in the fashion industry was conducted by [Bertram, Chi, 2018] using secondary data. The results showed that online shopping is generally more environmentally friendly than traditional purchasing; however, intermediary factors such as excessive packaging, delivery speed, and product returns may increase waste generation and carbon emissions.

At the country level, [Yousef et al., 2022] examined why Nigerian SMEs have been slow to adopt e-commerce as a means of improving efficiency [Omeje et al., 2022b]. Survey data and descriptive statistics were used in the analysis. The findings indicated that small and medium-sized enterprises (SMEs) constitute a major component of Nigeria's productive sector. However, several obstacles hinder their adoption of e-commerce, including technological challenges, inadequate Internet security, weak regulatory support, and limited knowledge of online platforms and Internet banking systems. The study therefore recommended the implementation of effective policies to strengthen e-commerce adoption and support the sustainable growth of the SME sector. While [Omeje et al., 2022c; 2024] examined issues related to financial inclusion, [Onuora et al., 2019] investigated e-commerce adoption as a tool for economic diversification in Nigeria. The results indicated that inadequate ICT infrastructure limits the potential benefits of e-commerce for African economies. The study emphasized the importance of e-commerce for Nigeria's economic growth and recommended that the government implement policies that create a supportive environment for both domestic and foreign firms seeking to leverage e-commerce opportunities.

Similarly, [Isibor et al., 2018] examined the role of e-commerce in promoting consumer satisfaction and economic growth in Nigeria. Using paired-sample t-test and secondary data, the study found that e-commerce had only a limited effect on consumer satisfaction and economic growth. The authors recommended promoting inclusive e-commerce through digital education initiatives across the country. In another study, [Chukwuemeka et al., 2019] analyzed the impact of e-commerce on Nigeria's economic growth between 1980 and 2018 using an autoregressive distributed lag (ARDL) model. The results showed that e-commerce has a positive and statistically significant effect on Nigeria's economic growth in both the short and long run. The study recommended that the government increase investment in the e-commerce sector to accelerate economic growth. A related study by [Ukwuoma, 2019] used secondary data from 2008 to 2018 to examine the effect of e-commerce on Nigeria's economic growth using ordinary least square (OLS) regression. The findings suggested that GDP per capita and population had a negative effect on economic growth. The study recommended increased investment and the develop-

ment of a national ICT master plan to strengthen the country's digital economy.

In Nigeria, [Khan, Uwemi, 2018] also examined the influence of e-commerce schemes on the use of e-commerce services. Using survey data and descriptive statistics, the study found that consumers, employees, and suppliers significantly influence e-commerce adoption. The authors recommended that government agencies implement policies aimed at increasing e-commerce usage among stakeholders. The role of mobile broadband in promoting e-commerce and economic growth in Nigeria was examined by [Gbahabo, Ajuwon, 2019]. The study showed that mobile broadband penetration significantly promotes economic growth by stimulating the adoption of e-commerce. The results also indicated the presence of bidirectional causality between economic growth and mobile broadband development. Another study by [Adebayo, 2015] identified five consumer-related factors influencing service delivery in Nigerian e-commerce and e-banking services. Using quantitative methods and survey data, the study found that customer data protection, knowledgeable staff, and employees' willingness to assist customers were key determinants of service quality.

The long-term impact of ICT on e-commerce and economic growth in Sub-Saharan Africa (SSA) was examined by [Albiman, 2016] using nonlinear modeling and secondary data. The results indicated that Internet and mobile penetration act as major drivers of economic growth. The study further found that human capital, institutional quality, and domestic investment are important channels through which ICT contributes to economic development. Similarly, [Ibrahim, Abubakar, 2015] examined the adoption of e-commerce technology in Nigeria. Using descriptive statistics, chi-square tests, and primary data from 112 respondents, the study found that electronic payment solutions are becoming increasingly available in Nigeria. The authors recommended that policymakers develop a comprehensive regulatory framework for e-commerce in order to strengthen consumer trust.

The role of electronic commerce in promoting the growth of emerging online market firms was examined by [Adejoh, 2015]. Using descriptive and inferential statistics, multiple regression analysis, and survey data from 117 Konga employees, the study found that e-commerce significantly contributes to the development of the Konga online marketplace ( $F(1,126) = 25.270$ ,  $R^2 = 0.168$ ,  $p < 0.05$ ). The results indicated that the level of e-commerce adoption explains approximately 16.8% of the variation in the development of the Konga online marketplace. The study therefore recommended the introduction of policies aimed at increasing the adoption of e-commerce in Nigeria. Using time-series data from 1970 to 2010, [Asogwa et al., 2013] examined telecommunications expenditure in Nigeria and its relationship with e-commerce and economic growth through multiple regression analysis based on the OLS estimation technique. The results showed that while unemployment negatively affects e-commerce and economic growth in Nigeria, telephony development, foreign direct investment (FDI), and trade openness have positive and statistically significant effects. The study therefore suggested that telecommunications should be properly utilized to support sustainable economic growth and that all

stakeholders in emerging economies should be actively involved in this process.

In another study, [Olalekan, 2013] examined how real telecommunications investments influenced e-commerce development in Nigeria between 1980 and 2010. The findings indicated that labor employment, capital stock, real telecommunications investment, and electricity supply significantly influence both e-commerce and economic growth in Nigeria. The study recommended that the government create favorable business conditions in order to attract further investment. Finally, [Afolabi, 2012] examined the effect of globalization, accounting information technology, and e-commerce on selected Nigerian firms using descriptive statistics and survey data. The results indicated that e-commerce had no statistically significant impact on the selected firms. The study concluded that businesses should be encouraged to expand online services to both existing and potential customers. Similarly, [Ayo, 2011] investigated the opportunities and challenges associated with business-to-consumer (B2C) e-commerce adoption in Nigeria using survey data and the extended Technology Acceptance Model (TAM). The results showed that the model variables were significantly related, with intention to use being strongly influenced by task-technology fit and perceived usefulness, with coefficients of 0.2623 and 0.2002, respectively.

## 2. Materials and Methods

Romer's endogenous growth model (1986) forms the basis of the econometric model specification in this study. It provides an important contribution to the understanding of technological innovation and economic growth [Rogers, 2003]. The model emphasizes the role of investment in the diffusion of technology and its relationship with economic growth [Romer, 1986]. The theory attributes increasing returns to scale to aggregate production [Lucas, 1988]. It assumes that investments in infrastructure, education, skills, and ICT generate external economies and productivity improvements [Karpunina et al., 2021]. However, insufficient investment in these sectors deprives developing countries of broader social gains associated with such investments. When firms receive no direct individual benefit from these externalities, incentives for private investment formation are weakened, which may lead the unrestricted market to accumulate less than the optimal level of capital. The aggregate production function, assuming symmetry across industries in which each industry requires the same amount of labor and capital, is mathematically specified as:

$$Y = AK^{a+b} L^{1-a} \quad (2)$$

Using Konga and Jumia as a case studies, this research employs conventional time-series analysis to empirically examine the effect of e-commerce on the Nigerian economy. For this purpose, the Autoregressive Distributed Lag (ARDL) model developed by [Pesaran et al., 2001] is used. The ARDL approach can be applied regardless of whether the variables are integrated of the same order, that is, I(0), I(1), or a mixture of both.

The ARDL model produces reliable estimates even in the presence of endogenous explanatory variables and relatively small sample sizes [Menyah, Wolde-Rufael, 2010]. Even with

small samples, the model helps address the potential endogeneity of explanatory variables. After establishing the order of integration of the variables, the ARDL procedure is implemented in three stages. The first step is to determine the optimal lag length using information criteria such as the Akaike Information Criterion (AIC), Schwarz Bayesian Information Criterion (SBIC), or Hannan—Quinn Information Criterion (HQIC). The second step involves applying the Bounds testing to determine whether cointegration exists among the variables. Once cointegration among the variables is confirmed, the ARDL framework and the corresponding Error Correction Model (ECM) are used to estimate the long-run and short-run parameters. Because the variables are integrated of order zero and order one—that is, they are stationary at level  $I(0)$  and at first difference  $I(1)$ —the ARDL approach is appropriate for examining both the long-term and short-term relationships among the variables.

Before specifying the ARDL model, the functional form of the estimable model is expressed as follows:

$$ECG_t = f(NPJ, NPK, NIU, TEI, NTS), \quad (3)$$

where  $ECG$ —economic growth proxied by GDP growth rate;  $NPJ$ —number of users conducting transactions on Jumia in Nigeria,  $NPK$ —number of users conducting transactions on Konga in Nigeria,  $NIU$ —number of Internet users,  $TEI$ —telecommunications investment,  $NTS$ —number of telephone subscribers.

The estimable Autoregressive Distributed Lag (ARDL) model in its econometric form is given as:

$$ECG_t = \alpha_0 + \sum_{i=1}^n a_i ECG_{t-i} + \sum_{j=0}^n \theta_{1j} NPJ_{t-j} + \sum_{j=0}^n \theta_{2j} NPK_{t-j} + \sum_{j=0}^n \theta_{3j} NIU_{t-j} + \sum_{j=0}^n \theta_{4j} TEI_{t-j} + \sum_{j=0}^n \theta_{5j} NTS_{t-j} + \mu_t, \quad (4)$$

where the variables are as defined above,  $\alpha_0$  denotes the constant term,  $a_i$  represents the parameters for the lagged dependent vari-

able ( $ECG_{t-i}$ ) in the autoregressive specification  $\theta_{1, \dots, 5, i}$  represent the parameters of the lagged explanatory variables,  $\sum_{j=0}^n$  denotes the summation notation for the lagged explained variables from  $i = 1, \dots, n$ ,  $\sum_{j=0}^n$ —summation operator,  $\mu$  represents the error term, and  $t$  denotes time.

Once evidence of cointegration is established, the study estimates the ARDL error correction model (ARDL-ECM) specified as (5):

$$\Delta ECG_t = \alpha_0 + \sum_{i=1}^n a_i \Delta ECG_{t-i} + \sum_{j=0}^n \theta_{1j} \Delta NPJ_{t-j} + \sum_{j=0}^n \theta_{2j} \Delta NPK_{t-j} + \sum_{j=0}^n \theta_{3j} \Delta NIU_{t-j} + \sum_{j=0}^n \theta_{4j} \Delta TEI_{t-j} + \sum_{j=0}^n \theta_{5j} \Delta NTS_{t-j} + \lambda_1 ECM_{t-1} + \mu_t, \quad (5)$$

where  $\Delta$ —difference operator,  $\lambda$ —speed of adjustment toward equilibrium, and  $ECM_{t-1}$ —the error-correction term.

The data used in this study consist of monthly time-series observations from 2017M1 to 2023M12. This period was selected because sufficient data are available. The variables of interest include the dependent variable, economic growth (proxied by the GDP growth rate), which was obtained from the National Bureau of Statistics<sup>4</sup>. The independent variables include Jumia users (NPJ), used as a proxy for e-commerce activity on Jumia, and Konga users (NPK), used as a proxy for e-commerce activity on Konga. Data were obtained from Jumia and Konga, respectively. Data on the number of Internet users, telecommunications investment, and the number of telephone subscribers were obtained from the National Bureau of Statistics<sup>5</sup>.

Descriptive statistics summarize the general characteristics of the variables used in the regression estimation. The results are presented in Table 1.

The descriptive statistics presented in Table 1 summarize the behavior and distribution of the variables used in the regression analysis, including their mean, median, standard deviation, skewness, and kurtosis values. A total of 84 observations are included in the dataset. The variables are considered normally distributed when the probability value of the Jarque-Bera (JB)

**Table 1**  
Descriptive Statistics

Variables	ECG	NPJ	NPK	NIU	NTS	TEI
Mean	23.29647	3.22E+08	156.2864	52.13067	2.38E+11	571.2000
Median	27.49972	3.20E+08	157.1106	42.08754	2.63E+11	547.4414
Maximum	37.50304	6.90E+08	198.1981	136.9104	3.16E+11	744.3780
Minimum	-1.027721	-4584482	104.7289	-3.621339	4.19E+10	470.7618
Std. Dev.	9.930484	2.53E+08	30.17311	44.21393	8.06E+10	78.72747
Skewness	-0.914098	0.050069	-0.120568	0.415534	-0.911454	0.650166
Kurtosis	2.812856	1.453161	1.723429	1.821626	2.668719	2.239208
Jarque-Bera	8.443318	6.006846	4.219450	5.198094	8.581860	5.674164
Probability	0.104674	0.409617	0.121271	0.704344	0.103692	0.058596
Sum	1397.788	1.93E+10	9377.183	3127.840	1.43E+13	34272.00
Sum Sq. Dev.	5818.256	3.76E+18	53714.58	115337.5	3.83E+23	365682.9
Observations	84	84	84	84	84	84

Source: authors' computation using Eviews 10.

<sup>4</sup> Nigerian Statistics (2024). National Bureau of Statistics Pubs. <https://nigerianstat.dev.codeforafrica.org/>.

<sup>5</sup> Ibid.

statistic exceeds the 0.05% significance level. In this case, the probability values suggest that the variables—including economic growth, the number of Jumia and Konga users in Nigeria, the number of Internet users, telecommunications investment, and the number of telephone subscribers—are normally distributed. Additionally, the skewness and kurtosis statistics further support the descriptive statistics. Skewness measures the asymmetry of a distribution around its mean. A normal distribution has a skewness value of zero. A distribution with a long right tail is positively skewed, while a distribution with a long left tail is negatively skewed. Table 1 shows that ECG, NPK, and NTS are negatively skewed, indicating distributions with long-left tails, whereas NPJ, NIU, and TEI are positively skewed, indicating distributions with long right tails.

### 3. Results

This study first conducted pre-estimation tests, including the stationarity (unit root) test and the bound tests for cointegration, before presenting the main estimation results. These tests are discussed below.

#### 3.1. Pre-Estimation Tests

For the unit root analysis, the Augmented Dickey-Fuller (ADF) test was used. In this test, if the p-value exceeds 0.05, the null hypothesis of a unit root cannot be rejected. The results are presented in Table 2.

**Table 2**  
Unit Root Test

Augmented Dickey-Fuller (ADF)			
Variables	Level	First difference	Inference
ECG	-3.506468*	–	I(0)
LTEI	-3.135207*	–	I(0)
LNTS	-1.739985	-6.129733*	I(1)
LNIU	-3.268363	-9.129784*	I(1)
NPJ	-13.27338*		I(0)
NPK	-4.653718*		I(0)

Notes: 1. Reported values represent the test statistics. 2. \* indicates significance at the 5% level. 3. The Augmented Dickey-Fuller (ADF) tests were conducted with an intercept and trend.

Source: authors' computation using Eviews 10.

Table 2 presents the results of the unit root test, indicating that the variables are stationary at either I(0) or I(1). The Augmented Dickey-Fuller (ADF) test shows that economic growth, telecommunications investment, the number of Jumia and Konga users conducting transactions in Nigeria is stationary at level, i.e., (I(0)). In contrast, the number of Internet users, and the number of telephone subscribers are stationary at first difference (I(1)).

Given that the unit root test indicated that the variables were integrated of order I(0) and I(1), the ARDL bounds testing approach developed by [Pesaran et al., 2001] was employed to test for cointegration among the variables. The results are presented in Table 3.

**Table 3**  
Bounds Test for the Model

Test Statistic	Value	Signif. (%)	I(0)	I(1)	Result
F-statistic	33.41735	10	2.26	3.35	
		5	2.62	3.79	Cointegrated
		2.50	2.96	4.18	
		1	3.41	4.68	

Source: authors' computation using Eviews 10.

As shown in Table 3, the calculated F-statistic (33.41735) exceeds both the lower and upper critical bounds at the 0.05 significance level. As a result, the study finds evidence of cointegration among the variables included in the analysis and rejects the null hypothesis of no cointegration, indicating the existence of a long-run relationship among the variables included in the model. Consequently, both the short-run and long-run ARDL models were estimated.

#### 3.2. Results of the Autoregressive Distributed Lag (ARDL) Model

The bounds test confirmed the presence of cointegration among the variables; therefore, both the long-run and short-run ARDL estimates were obtained. The long-run results are presented in Table 4.

The short-run parameters of the model are presented in Table 5.

**Table 4**  
Long-Run ARDL Regression Results

Variables	Coefficient	Std. Error	t-Statistic	p-value
ECG(-1)	0.800650	0.288647	2.773801	0.0080
NPJ	0.351928	0.120870	2.911626	0.0058
LNPJ	0.116985	0.012311	9.502477	0.0000
LNTS	0.102308	0.065401	1.564325	0.1246
LTEI	0.685079	0.070565	9.708481	0.0000
LNIU	-0.003451	0.001775	-1.944390	0.0580
C	0.407457	0.0519446	7.844159	0.0000
R <sup>2</sup> = 0.987061 Adjusted R <sup>2</sup> = 0.984249 F-statistic = 350.9264 Prob(F-statistic) = 0.000000 Durbin-Watson = 1.593805				

Source: authors' computation using Eviews 10.

**Table 5**  
Short-Run ARDL Regression Results

Variables	Coefficient	Std. Error	t-Statistic	P-value
D(ECG(-1))	0.792236	0.288480	2.746244	0.0086
D(NPJ)	0.389739	0.125845	3.096980	0.0035
D(NPK)	0.235858	0.054398	4.335784	0.0001
D(LNTS)	0.179022	0.115703	1.547249	0.1287
D(LTEI)	0.119877	0.014113	8.494084	0.0000
D(NIU)	0.269886	0.026978	10.003929	0.0000
ECM(-1)	-0.749827	0.161987	4.629019	0.0000
C	0.071095	0.536325	0.132560	0.8952

Source: authors' computation using Eviews 10.

### 3.3. Post-Estimation Tests

Autocorrelation was tested using the Breusch-Godfrey serial correlation LM test, which allows testing for autocorrelation at higher lag orders.

Hypotheses:

- $H_0$ : There is no autocorrelation;
- $H_1$ : There is autocorrelation.

Decision rule: Reject the null hypothesis if the p-value is less than 0.05 at 5% significance level. The results of the test are presented in Table 6.

**Table 6**  
Autocorrelation Output

Obs*Chi-Squared	2.051563
Prob. Chi-Square (2)	0.3585

Source: authors' computation using Eviews 10.

As shown in Table 6, the probability value of the chi-square statistic (0.3585) exceeds 0.05. Therefore, the null hypothesis cannot be rejected, indicating that there is no serial correlation in the residuals.

The White test was used to examine heteroskedasticity in the residuals. This test evaluates whether the variance of the residuals is constant, as required by the BLUE (Best Linear Unbiased Estimator) properties of the classical linear regression model.

Hypotheses:

- $H_0$ : The variances are homoskedastic;
- $H_1$ : The variances are heteroskedastic.

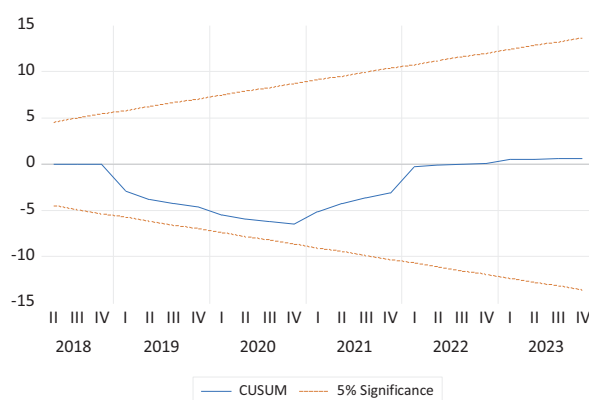
Decision rule: Reject the null hypothesis if the p-value is less than 0.05.

**Table 7**  
Heteroskedasticity Output

Obs*Chi-Squared	41.82377
Prob. Chi-Square (2)	0.8660

Source: authors' computation using Eviews 10.

The probability value of the chi-square statistic in Table 7 (0.8660) exceeds 0.05, indicating that the null hypothesis cannot



a)

be rejected. Therefore, the residuals are homoskedastic, suggesting that the variance of the error term is constant.

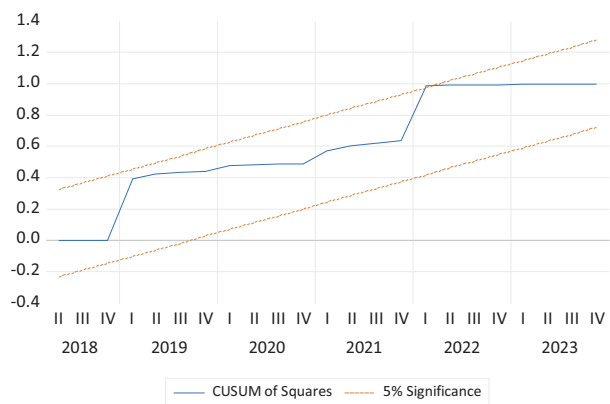
To examine parameter stability, the CUSUM and CUSUMSQ tests were applied. These tests determine whether structural breaks exist in the model and whether the estimated coefficients remain stable over time. This stability test allows us to accept the model's output. The results, presented in Figure 4, show that all coefficients remain within the 5% critical bounds, indicating that the estimated model is stable over the sample period.

The results of the CUSUM test show that the cumulative sum of recursive residuals remains within the 5% critical bounds, indicating that the null hypothesis of parameter stability cannot be rejected. Similarly, the CUSUMSQ plot remains within the 5% critical bounds, suggesting that the estimated model is stable over the sample period.

## 4. Discussion

In the long run, past economic growth ( $ECG(-1)$ ) was found to have a positive and statistically significant effect on current economic growth, with a coefficient of 0.800650 (about 80.07%). This result is not surprising, as countries that experienced economic growth in previous periods tend to maintain policies and strategies that sustain this growth trajectory. The implication of this finding is that an increase in previous economic growth ( $ECG(-1)$ ) significantly stimulates current economic growth. In the short run, past economic growth ( $ECG(-1)$ ) also shows a positive and significant effect on current economic growth, with a coefficient of 0.792236 (about 79.22%). This finding similarly suggests that prior economic expansion tends to reinforce current growth dynamics. These results are consistent with the findings of [Ibiam et al., 2017; Navrang, Meenu, 2018; Banescu, Manea, 2022].

Jumia users (NPJ) showed a positive and statistically significant relationship with economic growth in the long run, with a coefficient of 0.351928. This indicates that an increase in the number of Jumia users contributes positively to economic growth in Nigeria. On average, this corresponds to approximately a 35.19% increase in economic growth. This finding suggests that improved access to digital infrastructure, including faster Internet connectivity, greater Internet penetration, the development of the Internet of things (IoT), and other channels of e-commerce



b)

Source: authors' computation using Eviews 10.

**Fig. 4. Parameter stability tests: (a) CUSUM test, (b) CUSUMSQ test**

accessibility, may significantly enhance Jumia-based transactions and strengthen Nigeria's digital economy, thereby stimulating economic growth. Similarly, in the short run, Jumia users (NPJ) have a positive and statistically significant effect on economic growth, with a coefficient of 0.389739. This indicates that increased participation in Jumia-based transactions positively influences economic growth in Nigeria. On average, this corresponds to approximately a 38.97% increase in economic growth. These findings are consistent with the study by [Karpunina et al., 2021], which found that the development of e-commerce significantly encourages economic growth.

Konga users (LNPK) also show a positive and statistically significant relationship with economic growth in Nigeria. In the long run, the coefficient of this variable is 0.116985, indicating that an increase in the number of Konga users contributes positively to economic growth in Nigeria. On average, a 1% increase in the number of Konga users corresponds to approximately an 11.70% increase in economic growth in the long run. In the short run, Konga users (NPK) also have a positive and statistically significant effect on economic growth with a coefficient of 0.235858. This indicates that increased use of the Konga platform contributes positively to Nigeria's economic growth. On average, this corresponds to approximately a 23.59% increase in economic growth. These results are consistent with previous studies [Couture et al., 2018; Karpunina et al., 2021], which show that the integration of e-commerce into the economy significantly improves economic growth.

The number of telephone subscribers (LNTS) has a coefficient of 0.102308 in the long run, indicating a positive but statistically insignificant relationship with economic growth in Nigeria. Although this result conforms to a priori expectations, its statistical insignificance suggests that the increasing number of telephone subscribers alone may not be sufficient to significantly stimulate economic growth. One possible explanation is that network coverage and service quality, particularly in the rural areas, remain insufficient to generate a strong economic impact. In the short run, the number of telephone subscribers (LNTS) also shows a positive but statistically insignificant coefficient of 0.179022, indicating a positive but insignificant relationship with economic growth in Nigeria. This result may appear surprising, as it is generally expected that an increase in the number of telephone subscribers would significantly influence economic growth. However, the implication of this result is that, holding other factors constant, a 1% increase in the number of telephone subscribers leads on average to about a 17.90% increase in Nigeria's economic growth in the short run, although this increase is statistically insignificant. This finding nevertheless conforms to a priori expectations that an expansion in telecommunications services may support economic activity. It therefore suggests that the number of telephone subscribers contributes positively, though insignificantly, to economic growth in Nigeria in the short run. Similar conclusions have been reported in previous studies [Anuj et al., 2018; Bitrus, 2019; Ogbonne et al., 2021; Zhang, Han, 2025], which found that as the number of telephone subscribers increases, e-commerce activity tends to expand, thereby encouraging economic growth.

Telecommunications investment (LTEI) was found to have a positive and statistically significant effect on economic growth. In the long run, the coefficient of telecommunications invest-

ment is 0.685079, indicating that a 1% increase in telecommunications investment leads to approximately a 68.51% increase in economic growth in Nigeria. This result conforms to a priori expectations and suggests that increased investment in telecommunications infrastructure promotes the development of e-commerce activities and, consequently, economic growth. Similarly, in the short run, telecommunications investment (LTEI) also has a positive and statistically significant effect on economic growth, with a coefficient of 0.119877. This result indicates that increased telecommunications investment stimulates economic growth in Nigeria even in the short run. Therefore, a 1% increase in telecommunications investment leads to about an 11.99% increase in economic growth. This finding conforms to a priori expectations and suggests that increased investment in telecommunications infrastructure would lead to the expansion of e-commerce activities and, consequently, stimulate economic growth in Nigeria. These findings are consistent with previous studies [Zatonatska, Novosolova, 2017; Anuj et al., 2018; Bitrus, 2019; Onuora et al., 2019; Ogbonne et al., 2021; He et al., 2026].

The coefficient of the number of Internet users (NIU) is  $-0.003451$  in the long run, indicating a negative relationship between Internet users and economic growth. Although this effect is statistically insignificant at the 5% level, it becomes weakly significant at 10% level. With a coefficient of  $-0.003451$ , an increase in the number of Internet users by one person would, on average, lead to about a 0.35% insignificant decline in Nigeria's economic growth. This result suggests that Internet penetration in Nigeria may still be insufficient to produce a strong positive impact on economic growth [Omeje et al., 2022]. Limited access to reliable Internet services and the high cost of mobile data may partly explain this outcome. These findings do not conform to a priori expectations and differ from the results reported by [Anuj et al., 2018; Oladimeji, Folayan, 2018; Bitrus, 2019; Janet, 2021]. However, in the short run, the number of Internet users (NIU) shows a positive and statistically significant effect on economic growth, with a coefficient of 0.269886. This result suggests that, in the short run, Nigerian economic growth and e-commerce activities are positively associated with the number of Internet users. The observed impact of the number of Internet users is statistically significant at the 5% level in explaining economic growth. The result further suggests that a one-unit increase in the number of Internet users would, on average, lead to about a 26.99% increase in Nigeria's economic growth. The economic implication of this result may be that, in the short run, there may be periods when Internet connectivity in Nigeria becomes faster and more reliable, allowing people in urban areas and some rural communities to access the Internet while performing online transactions. This situation could contribute to an increase in the number of Internet users in the short run. This finding conforms to a priori expectations and is also consistent with the findings of [Anuj et al., 2018; Oladimeji, Folayan, 2018; Bitrus, 2019; Gbaha, Ajuwon, 2019; Ukwuoma, 2019; Janet, 2021].

In the long run, the constant term (C) has a coefficient of 0.407457 when all other factors are held constant. This implies that, holding all other factors constant, a unit increase in the constant term would, on average, result in about a 40.75% increase in economic growth. However, in the short run, when all other factors are also held constant (C), the coefficient of the constant

term is 0.071095, indicating that, holding these factors constant, a unit increase in the constant term would, on average, lead to about a 7.11% increase in economic growth in the short run.

Finally, the coefficient of the error correction mechanism (ECM(-1)) is  $-0.749827$  with a p-value of 0.0000. This value indicates that the speed of adjustment is about 74.98%. This implies that deviations from the long-run equilibrium would be corrected at a rate of about 74.98% in order for the system to return to its equilibrium position. This satisfies the condition for the error correction mechanism, which requires that the coefficient of the ECM(-1) be negative in order for the system to return to equilibrium.

## Conclusions

The study examined the impact of e-commerce on the Nigerian economy using Konga and Jumia as case studies, with monthly data covering the period from 2017M1 to 2023M12. The study adopted the Autoregressive Distributed Lag (ARDL) estimation technique and the bounds test for cointegration. The analytical framework was based on Romer's endogenous growth model (1986), which emphasizes the role of investment in technological diffusion and its relationship to economic growth. The theory assumes that investments, particularly in infrastructure, technology (including the Internet and artificial intelligence), education, health, and telecommunications, generate external economies and productivity improvements. The results show that the number of telephone subscribers has a positive but statistically insignificant effect on economic growth in Nigeria in both the long run and the short run. In contrast, the telecommunications investment was found to have a positive and statistically significant effect on Nigeria's economic growth in both the long run and the short run. The variables representing Jumia users and Konga users were also found to be statistically significant and consistent with a priori expectations, indicating that participation in these e-commerce platforms positively contributes to economic growth in Nigeria. Furthermore, the number of Internet users was found to be statistically insignificant in the long run, and therefore does not conform to a priori expectations in the long run, although it becomes significant in the short run.

Based on these findings, the study recommends increased government investments in Internet infrastructure, particularly in rural areas, in order to expand Internet access and increase

the number of Internet users. This would enable greater participation in digital commerce and contribute more significantly to economic growth.

There is also a need to create an enabling environment for e-commerce businesses through increased investments in ICT by the government, its agencies, and other stakeholders in the country.

The results of the analysis further demonstrate that the number of Nigerians conducting online transactions on the Konga and Jumia platforms is statistically significant in explaining economic growth. Therefore, the Nigerian government should develop a comprehensive e-commerce strategy aimed at expanding the sector and formulating digital trade policies that promote both domestic and international trade through e-commerce platforms.

In addition, stronger collaboration between the government and the private sector is necessary to finance and develop a supportive digital environment, including ICT hubs and affordable Internet services that promote technological innovation, the Internet of Things (IoT), and digitization within the economy. Such initiatives would help strengthen the positive relationship between telecommunications investment and economic growth identified in this study. Adequate investment in the ICT sector would also improve digital literacy and further enhance economic growth in Nigeria.

The findings also indicate that the number of Internet users currently has a statistically insignificant effect on economic growth in Nigeria. This may be attributed to limited Internet accessibility and affordability, as well as the high cost of mobile data services provided by network operators. Therefore, the government should increase investment in Internet infrastructure to support economic growth as the global economy continues to evolve toward a more inclusive digital and artificial intelligence-driven environment.

Furthermore, public authorities should promote investment in technological knowledge among the population by supporting training and empowerment initiatives related to telecommunications technology. Efforts should also be made to increase the number of people using information and communication technologies (ICT) in order to support the achievement of the Sustainable Development Goals (SDGs) by 2030.

Finally, the government should strengthen regulatory oversight to ensure fair pricing and maintain high standards of product quality in the e-commerce market.

## References

- Adebayo S. (2015). Service Quality at Nigeria E-commerce and E-Banking Service. *International Journal of Management Sciences and Business Research*, 9(5): 15-18.
- Adejoh V.A. (2015). Role of E-Commerce in the Economic Development of Nigeria: A Case Study of Konga. *Texila International Journal of Management*, 4(1): 1-5.
- Adisak S. (2015). Service Quality at Thailand's Government E-Commerce Services. *International Journal of Management Sciences and Business Research*, 9(5): 15-18.
- Afolabi S.O. (2012). The Impact of E-Commerce, Accounting Information Technology and Globalization on Selected Firms in Nigeria. *International Journal of Economic Development Research and Investment*, 3(1): 33-39.
- Albiman Z.S. (2016). The Role of ICT Use on E-Commerce and Economic Growth in Sub-Saharan African Region (SSA). *Journal of Science and Technology Policy Management*, 7(3): 306-329.
- Alrawashedh N.H., Zuraiqat B., Abdallah A., Abushareah M. (2022). Accounting and Its Impact on E-Commerce in Jordan. *The Seybold Report*, 5(1): 107.

- Anjalika W.P.W., Priyanath H.M.S. (2018). Effect of Service Quality on Customer Satisfaction: An Empirical Study of Customers Who Have Bank Accounts in Both Public and Private Banks in Sri Lanka. *International Journal of Marketing and Technology*, 8(1): 11-32.
- Anuj K., Fayaz A., Kapoor G. (2018). Impact of E-Commerce in Indian Economy. *Journal of Scientific Research*, 10(2): 98-102.
- Anvari R.D., Norouzi D. (2016). The Impact of E-Commerce and R&D on Economic Development in Some Selected Countries. *Procedia Social and Behavioral Sciences*, (229): 354-362.
- Arrow J.K. (1962). *Economic Welfare and the Allocation of Resource Invention*. Princeton University Press.
- Asogwa F.O., Ohaleme K.K., Ugwuanyi R.O. (2013). The Impact of Telecommunication Expenditure on E-Commerce and Economic Growth in Nigeria. *Journal of Economic and Sustainable Development*, 4(13): 1-6.
- Asogwa P.N. (2013). Utilization of Information and Communication Technology (ICT) in Secondary School Administration in Obollo-Afor Education Zone of Enugu State. *Science and Education*: 1-12. <http://www.sciepub.com/reference/224103>.
- Ayo A.O. (2011). Emergence of Payment Systems in the Era of E-Commerce in Nigeria: Problems and Prospects. *Delta Business Education Journal*, 1(6): 64-72.
- Banescu C.E., Manea D. (2022). The Impact of E-Commerce on the Labour Market. *Sustainability*, (14): 2-17.
- Bertram R., Chi T. (2018). A Study of Companies' Business Responses to Fashion E-Commerce's Environmental Impact. *International Journal of Fashion Design, Technology and Education*, 11(2): 254-264. DOI: 10.1080/17543266.2017.1406541.
- Bitrus J. (2019). The Roles of Information and Communication Technologies (ICTs) and E-Commerce as Agents of Nigeria's Economic Development: Review of Challenges and Prospects. *Journal of Wireless Engineering and Technology*, 10(3): 41-54.
- Boateng R., Heeks R., Molla A., Hinson R. (2008). E-Commerce and Socio-Economic Development: Conceptualizing the Link. *Internet Research*, 18(5): 562-594. <https://www.emerald.com/insight/content/doi/10.1108/10662240810912783/full/html>.
- Chukwuemeka I.E., Egwaikhide C.I., Saheed Z.S., Alexander A.A., Farouk B.U.K., Adeneye O.A. (2019). Impact of E-Commerce on Economic Growth in Nigeria. *International Journal of Innovative Finance and Economics Research*, 7(3): 67-75.
- Couture V., Faber B., Gu Y., Liu L. (2018). E-Commerce Integration and Economic Development: Evidence from China. *National Bureau of Economic Research*, Working Paper 24384: 1-69. [https://www.nber.org/system/files/working\\_papers/w24384/revisions/w24384.rev0.pdf](https://www.nber.org/system/files/working_papers/w24384/revisions/w24384.rev0.pdf).
- Duncombe R., Heeks R. (2005). Information and Communication Technologies (ICT's): Poverty Reduction and Micro, Small and Medium Scale Enterprises (MSMEs). A Framework for Understanding ICT Applications for MSMEs in Developing Countries. *World Summit on the Information Society*, Tunis, 16-18 November: 1- 46/
- Gbahabo P.T., Ajuwon O.S. (2019). Mobile Broadband and Economic Growth in Nigeria. *Oradea Journal of Business and Economics*, 4(1): 65-78.
- He D., Cai Y., Zhao H., Wang Z. (2026). Regulatory Innovation for Digital Platforms in the Data-Intelligence Era and Its Implications for E-Commerce. *Journal of Theoretical and Applied Electronic Commerce Research*, 21(2): 1-25. DOI: 10.3390/jtaer21010002.
- Ibiam E.O., Boyinbode O.K., Afolabi M.O. (2017). E-Commerce in Africa: The Case of Nigeria. *EAI Endorsed Transactions on Serious Games*, 4(15): 1-6.
- Ibrahim I.A., Abubakar M. (2015). Technological Adoption of E-Commerce in Nigeria. *International Journal of Innovative Research in Engineering & Management*, 2(6): 1-8.
- Isibor A.A., Omankhanlen A.E., Okoye L.U., Achugamonu B.U., Adebayo M., Afolabi G.T., Ayodeji O.E. (2018). Impact of Electronic Banking Technology on Customers' Satisfaction and Economic Growth. *International Journal of Civil Engineering and Technology*, 9(12): 536-544.
- Janet J. (2021). Best E-Commerce Websites in Nigeria in 2021. *Nairametrics*: 1-5. <https://nairametrics.com/2021/12/17/best-e-commerce-websites-in-nigeria-in-2021/>.
- Karpunina E.K., Isaeva E.A., Galieva G.F., Sobolevskaya T.G., Rodin A.Y. (2021). E-Commerce as a Driver of Economic Growth in Russia. *Institute of Scientific Communication Conference*, (198): 1622-1633.
- Khan H.U., Uwemi S. (2018). Possible Impact of E-Commerce Strategies on the Utilisation of E-Commerce in Nigeria. *International Journal of Business Innovation and Research*, 15(2): 231-246.
- Lili Q., Yan C. (2014). The Impact of E-Commerce on China's Economic Growth. *Wuhan International Conference on e-Business*: 66-72.
- Lucas R.E. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, (22): 3-42.
- Menyah K., Wolde-Rufael Y. (2010). Energy Consumption, Pollutant Emissions and Economic Growth in South Africa. *Energy Economics*, 32(6): 1374-1382. DOI: 10.1016/j.eneco.2010.08.002.
- Miller R.L. (2015). Rogers' Innovation Diffusion Theory (1962, 1995). *Semantic Scholar*. DOI: 10.4018/978-1-4666-8156-9.CH016. <https://api.semanticscholar.org/CorpusID:168553318>.
- Navrang L., Meenu R. (2018). A Study on Customer Service of Banks in India. *International Journal of Research in Social Sciences*, 8(1): 58-60.
- Ogbonne I.P., Omeje A.N., Omenma J.T. (2021). Utilisation of information and Communication Technology among Informal Traders in the Local Economies in Nigeria. *International Journal of Entrepreneurship and Small Business*, 44(3): 211-234.

- Okolie U.C., Ojomo A.H. (2015). E-Commerce in Nigeria: Benefits and Challenges. *Journal of Humanities and Social Sciences*, 28(2): 69-90.
- Oladimeji T.T., Folayan G.B. (2018). ICT and Its Impact on National Development in Nigeria: An Overview, Research and Reviews. *Journal of Engineering and Technology*, 7(1): 5-10.
- Olalekan D.O. (2013). The Effect of Investment in Telecommunication on E-Commerce: Evidence from Nigeria. *International Journal of Advancements in Research and Technology*, 2(1): 1-23.
- Omeje A.N., Chukwu N.O., Mba A.J., Ugwu M.O. (2024). Financial Inclusion and the Growth of Micro, Small, and Medium Enterprises (MSMEs) in Nigeria. *International Journal of Business Performance Management*, 25(3): 327-344. DOI: 10.1504/IJB-PM.2024.10052523. <https://www.inderscience.com/info/ingeneral/forthcoming.php?jcode=IJBPM>.
- Omeje A.N., Mba A.J., Anyanwu O.C. (2022a). Impact of Insecurity on Enterprise Development in Nigeria. *Journal of Entrepreneurship in Emerging Economies*, 15(6): 1416-1437. DOI: 10.1108/JEEE-11-2021-0449.
- Omeje A.N., Mba A.J., Ugwu M.O. (2022b). Electricity Utilisation and Firm Efficiency in Nigeria: Evidence from Data Envelopment Analysis. *International Journal of Critical Infrastructures*, 18(3): 240-266. DOI: 10.1504/IJCIS.2022.125812.
- Omeje A.N., Mba A.J., Ugwu M.O., Amuka J., Agamah P.N. (2022c). Examining the Penetration of Financial Inclusion in the Agricultural Sector: Evidence from Small-Scale Farmers in Enugu State, Nigeria. *Agricultural Finance Review*, 82(1): 49-66. DOI: 10.1108/AFR-05-2020-0074.
- Onuora A.C., Ana P., Madubuike C.E., Ivo A.S. (2019). *Conference Paper on E-Commerce System: A Tool for Economic Diversification*. Cross River University of Technology, Calabar, Conference Paper: 1-9. <https://www.unicross.edu.ng/staff/doc/714c7e4199f6d9281d9f3308f553a8b41662729637.pdf>.
- Pearson M.H., Shin Y., Smith R. (2001). Bounds Test Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16: 289-326.
- Rogers E.M. (2003). *Diffusion of Innovations*. New York, Free Press.
- Romer P. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy*, (94): 1002-1037.
- Tan L.H., Chew B.C., Hamid S.R. (2016). Relationship between Service Quality and Customer Satisfaction: A Study of Malaysian Banking Industry. *International Journal of Productivity and Quality Management*, 19(1): 38-50.
- Toader E., Firtescu B.N., Roman A., Anton S.G. (2018). Impact of Information and Communication Technology Infrastructure on Economic Growth: An Empirical Assessment for the EU Countries. *Journal of Sustainability*, 10: 1-22.
- Ukwuoma H.M. (2019). The Effect of E-Commerce on Economic Growth in Nigeria. *International Journal of Management, Technology and Engineering*, 6(2): 2249-7455.
- Yousef A.E., Yazeed A.M., Ahmed H.H., Mahmoud A.K., Omar M.A., Abdilahi L., Zakarya A., Shadi M.S. (2022). E-Commerce Adoption: Problems Facing SMEs in Nigeria. *International Journal of Special Education*, 37(3): 6580-6591.
- Zatonatska T., Novosolova V. (2017). Modelling of Impact of E-Commerce on Economic Development in Ukraine. *Financial and Credit Activity Problems of Theory and Practice*, 1(22): 265-274. DOI: 10.18371/fcaptp.v1i22.110184.
- Zhang Y., Han Y. (2025). Does Cross-Border E-Commerce Broaden the Innovation Boundaries of Firms? Evidence from a Quasi-Natural Experiment in China. *Journal of Theoretical and Applied Electronic Commerce Research*, 20(358): 1-20. DOI: 10.3390/jtaer20040358.
- Ziaul H., Shawkat K., Ehsanul H.C. (2005). The Economic Impact of E-Commerce. *BRAC University Journal*, 2(2): 49-56.

## About the Authors

### Ambrose Nnaemeka Omeje

PhD (Econ.), Department of Auditing and Taxation, Faculty of Accounting and Informatics, Durban University of Technology (Durban, South Africa). ORCID: 0000-0002-4847-3232.

Research interests: business and economics, public, environmental and occupational health, engineering.

[ambrose.omeje@unn.edu.ng](mailto:ambrose.omeje@unn.edu.ng)

### Olive Stumke

PhD (Econ.), Professor, Department of Auditing and Taxation, Faculty of Accounting and Informatics, Durban University of Technology (Durban, South Africa). ORCID: 0000-0001-8240-6298.

Research interests: accounting, auditing.

[Olive.Stumke@gmail.com](mailto:Olive.Stumke@gmail.com)

### Denis Onyekachi Ezeogo

Department of Economics, Faculty of Social Sciences, University of Nigeria (Nsukka, Nigeria).

[deneiceonyeka99@gmail.com](mailto:deneiceonyeka99@gmail.com)

**Ravinder Rena**

PhD (Econ.), Professor of Economics, DUT Business School, Faculty of Management Sciences, Durban University of Technology (Durban, Republic of South Africa). ORCID: 0000-0002-4156-8693; Scopus Author ID: 56441653000.

Research interests: digital platforms for crowdfunding, the BRICS and the African economy, academic freedom within the constitutional framework of South Africa, sustainable development.

ravinder.rena1@gmail.com

**Равиндер Рена**

PhD (Econ.), профессор экономики, бизнес-школа DUT, факультет управленческих наук, Дурбанский технологический университет (Дурбан, Южная Африка). ORCID: 0000-0002-4156-8693; Scopus Author ID: 56441653000.

Научные интересы: цифровые платформы для краудфандинга, страны БРИКС и экономика Африки, академическая свобода в рамках конституционного права Южно-Африканской Республики, устойчивое развитие.

ravinder.rena1@gmail.com

**作者信息****Ambrose Nnaemeka Omeje**

经济学博士，审计与税务系，会计与信息学院，德班理工大学（南非德班）。ORCID: 0000-0002-4847-3232。

研究方向：商业与经济、公共健康、环境与职业健康、工程学。ambrose.omeje@unn.edu.ng

**Olive Stumke**

经济学博士，教授，审计与税务系，会计与信息学院，德班理工大学（南非德班）。ORCID: 0000-0001-8240-6298。

研究方向：会计、审计。

Olive.Stumke@gmail.com

**Denis Onyekachi Ezeogo**

经济系，社会科学学院，尼日利亚大学（尼日利亚恩苏卡）。

deneiceonyeka99@gmail.com

**Ravinder Rena**

经济学博士，经济学教授，DUT 商学院，管理科学学院，德班理工大学（南非德班）。ORCID: 0000-0002-4156-8693; Scopus Author ID: 56441653000。

研究方向：数字众筹平台、金砖国家与非洲经济、南非共和国宪法框架下的学术自由、可持续发展。

ravinder.rena1@gmail.com

The article was submitted on 22.01.2026; revised on 10.02.2026 and accepted for publication on 15.02.2026. The authors read and approved the final version of the manuscript.

文章于 22.01.2026 提交给编辑。文章于 10.02.2026 已审稿。之后于 15.02.2026 接受发表。作者已经阅读并批准了手稿的最终版本。