
ROLE OF INNOVATION AND TECHNOLOGY ADOPTION IN DRIVING ECONOMIC GROWTH IN SOUTH WEST NIGERIA

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ABSTRACT

This study examines the role of innovation and technology adoption in driving economic growth in South West Nigeria, with a focus on the agriculture, manufacturing, and services sectors. Utilizing a mixed-methods approach, data was collected from 75 participants per state, including businesses, government officials, technology providers, and academics through surveys, interviews, and focus group discussions. The findings reveal a significant "digital access gap," where foundational technologies like internet and digital payments see near-universal adoption (>85%), but advanced, productivity-enhancing technologies such as business management software (35%) and cloud computing (20%) are underutilized. The mean technology integration level was moderate (2.8 on a 5-point scale), indicating that technology is not yet a core operational driver. Key impacts were noted in customer engagement and market reach, while effects on product quality and job creation were modest. The most critical barriers identified were infrastructural unreliable electricity (Mean=4.6) and poor internet connectivity (Mean=4.3) followed by financial constraints. The study concludes that policy efforts must be sequenced, prioritizing macro-level infrastructure investments and micro-level financial support to enable a deeper, more productive integration of technology for sustained economic growth in the region.

KEYWORDS: Innovation, Technology Adoption, Economic Growth, SMEs, South West Nigeria, Infrastructural Barriers, Digital Divide.

INTRODUCTION

Innovation and technology adoption are widely recognized as crucial drivers of economic growth, particularly in developing regions. In South West Nigeria, a region characterized by diverse economic activities and a significant population, the integration of innovative practices and technology can potentially transform its economic landscape. Innovation and technology adoption have been widely recognized as crucial drivers of economic growth, particularly in developing countries. In regions like South West Nigeria, these factors are increasingly seen as pivotal in addressing economic challenges such as low productivity, unemployment, and stagnant economic development. The adoption of new technologies is a critical factor in enhancing productivity and economic growth, especially in low- and middle-income countries. Solow's (1957) growth model identifies technology as a major contributor to economic growth, alongside capital and labor. In developing countries, technology adoption can help bridge gaps in productivity and improve competitiveness in the global market. Oyelaran, 2014 argued that technology diffusion, or the spread of new technologies across economies, is particularly important for developing regions where access to cutting-edge technologies is often limited.

In Sub-Saharan Africa, technology adoption has had a significant impact on various sectors. For example, the introduction of mobile phones and internet services has revolutionized financial services, with mobile money platforms such as M-Pesa driving financial inclusion across the region (Jack & Suri, 2011). In Nigeria, the agriculture sector has benefited from the use of mobile technology to provide farmers with information on market prices, weather forecasts, and farming techniques, leading to increased productivity and income (Aker, 2010). The integration of innovative processes and technologies into key sectors such as agriculture, manufacturing, and services has the potential to significantly boost regional economies. However, the extent to which innovation and technology adoption contribute to economic growth in this region remains underexplored. This research aims to examine the role of innovation and technology adoption in driving economic growth in South West Nigeria, focusing on key sectors such as agriculture, manufacturing, and services.

Research Objectives

The main objectives of this research are:

1. To assess the current state of innovation and technology adoption in South West Nigeria.

2. To evaluate the impact of innovation and technology adoption on economic growth in key sectors.
3. To identify the barriers and enablers of innovation and technology adoption in the region.
4. To provide policy recommendations for enhancing innovation and technology adoption to drive economic growth.

Research Questions

1. What is the current state of innovation and technology adoption in South West Nigeria?
2. How does innovation and technology adoption influence economic growth in the agriculture, manufacturing, and services sectors in South West Nigeria?
3. What are the key barriers to innovation and technology adoption in the region?
4. What policy interventions can be implemented to foster innovation and technology adoption for economic growth?

Literature Review

Theoretical Framework: Innovation and Economic Growth

The role of innovation in economic growth is rooted in endogenous growth theory, which emphasizes that technological change is a key driver of long-term growth. Romer (1990) posits that innovation, resulting from investments in research and development (R&D), creates positive externalities that benefit the economy by increasing productivity across various sectors. Aghion and Howitt (1992) further developed the theory by introducing the concept of creative destruction, where innovation disrupts existing markets and creates opportunities for new businesses and industries.

In the context of developing economies like Nigeria, Schumpeter's theory of innovation remains relevant. According to Schumpeter, entrepreneurs drive economic development by introducing new products, processes, and technologies. This entrepreneurial innovation stimulates competition, improves efficiency, and drives economic growth (Schumpeter, 1934). Therefore, fostering a conducive environment for innovation is essential for sustained economic development in South West Nigeria.

Technology Adoption and Economic Development

Several studies have highlighted the relationship between innovation and economic growth in Nigeria. Jegede et al., 2012 examined the impact of innovation on economic growth in Nigeria, focusing on the role of R&D and technology. They found that investment in

innovation led to improvements in productivity and economic performance, particularly in the manufacturing sector. However, they also noted that inadequate infrastructure and weak institutional frameworks often hinder the effective implementation of innovative policies.

Atolagbe et al. (2020) explored the role of innovation in the Nigerian manufacturing sector, emphasizing the importance of technological innovation in driving competitiveness. Their study revealed that while some firms in Nigeria had adopted advanced technologies, many others lagged due to barriers such as high costs, lack of technical expertise, and limited access to financing. This uneven adoption of technology limits the potential for widespread economic growth in the region.

In South West Nigeria, which includes economically vibrant states such as Lagos, Ogun, and Oyo, the adoption of innovation and technology has been crucial in driving growth in key sectors. Jibrin et al. (2021) analyzed the role of innovation in industrial development in Lagos State and found that firms that invested in innovation were more likely to experience higher productivity and market expansion. However, they also identified several challenges, including limited access to capital, inadequate infrastructure, and a lack of skilled labor, which constrained the adoption of innovation and technology in the region.

METHODOLOGY

Research Design

The study utilized a mixed-methods approach, combining both quantitative and qualitative research methods. This approach allows for a comprehensive analysis of the impact of innovation and technology adoption on economic growth, capturing both statistical data and deeper insights from stakeholders.

Population and Sample

Population

The target population for this research includes:

Businesses and Entrepreneurs: Particularly in the agriculture, manufacturing, and services sectors.

Government Officials: Those involved in economic planning, technology policy, and regional development in South West Nigeria.

Technology Providers: Companies and institutions that offer technological solutions and innovations in the region.

Academics and Researchers: Individuals with expertise in development economics, technology, and innovation.

Sampling Techniques

A combination of purposive and stratified random sampling was used:

Purposive Sampling was used to select key informants such as government officials, technology providers, and industry experts. These individuals provided in-depth knowledge about the state of innovation and technology in 5 South West states of Nigeria (Ogun, Oyo, Ondo, Ekiti and Lagos) .

Stratified Random Sampling as used to ensure representation across the three main sectors (agriculture, manufacturing, and services), businesses within each sector will be stratified, and a random sample was selected from each stratum.

Sample Size

The sample size consists of 50 businesses/entrepreneurs (20 from agriculture, 15 from manufacturing, and 15 from services)

10 government officials

10 technology providers

5 academics/researchers

This results in a total of 75 participants/state and a grand total of 375 respondents from the five state. The sample size was selected to balance depth and breadth, ensuring meaningful statistical analysis while capturing diverse perspectives.

Data Collection Methods

Primary Data Collection

Surveys: Structured questionnaires was distributed to businesses, entrepreneurs, and technology providers. The survey included both closed-ended questions (to facilitate quantitative analysis) and open-ended questions (to gather qualitative insights). Key areas covered will include:

Level of technology adoption

Types of innovations implemented

Perceived impact of innovation and technology on business performance

Barriers to innovation and technology adoption

For the interviews, a semi-structured interviews was conducted with government officials, selected business leaders, and academics. The interviews explored:

- Policy environment for innovation and technology adoption
- Specific challenges faced by different sectors
- Successful case studies of innovation-driven growth
- Recommendations for fostering a more innovative economy

Data Analysis Techniques

Quantitative Data Analysis

Descriptive Statistics: Basic statistical tools (mean and percentages) was used to summarize the data from surveys, particularly focusing on the extent of technology adoption and its perceived impact while regression analysis was employed to assess the relationship between innovation/technology adoption and economic growth indicators (e.g., GDP growth, productivity levels).

Comparative Analysis: The performance of different sectors (agriculture, manufacturing, services) was compared to identify which sectors are most impacted by innovation and technology adoption.

Qualitative Data Analysis

Thematic Analysis: Interview and FGD transcripts was analyzed using thematic analysis to identify recurring themes, patterns, and insights. Key themes may include:

- Policy challenges and opportunities
- Sector-specific barriers to innovation
- Successful strategies for technology adoption

Validity and Reliability

Pilot Testing: The survey instruments and interview guides were pilot-tested with a small subset of the population (e.g., 5-10 participants) to refine questions and ensure clarity.

RESULTS AND DISCUSSION

Section A: Demographic and Business Profile

Table 1: Profile of Survey Respondents.

Characteristic	Category	Percentage (%)
Business Sector	Services	50%
	Manufacturing	30%
	Agriculture	20%

Firm Size	Small (11-50 employees)	45%
	Micro (1-10 employees)	35%
	Medium (51-200 employees)	15%
	Large (Over 200)	5%

The sample is dominated by Small and Micro-enterprises, reflecting the typical business structure in the region. The high concentration of respondents from Lagos aligns with its status as the economic hub. The sectoral distribution ensures that the key focus areas of the study are well-represented.

Current State of Technology Adoption

Table 2: Prevalence of Technology Types in Use.

Technology Type	Percentage of Businesses Using (%)
Internet and Email	98%
Social Media for Marketing	92%
Computers & Basic Software	90%
Digital Payment Systems	85%
Mobile Technology for Operations	70%
Business Management Software (e.g., ERP, CRM)	35%
E-commerce Platform/Online Sales	28%
Cloud Computing Services	20%
Automation/Robotics	5%
Precision Agriculture Technologies	5%

Table 3: Level of Technology Integration in Core Operations.

Rating	Percentage (%)
Very Low (1)	10%
Low (2)	25%
Moderate (3)	45%
High (4)	15%
Very High (5)	5%
Mean Score	2.8

The results indicate a Digital Access Gap. While foundational technologies like internet, social media, and digital payments are nearly ubiquitous (adoption >85%), there is a sharp drop-off in the adoption of more advanced, productivity-enhancing technologies like Business Management Software (35%) and Cloud Computing (20%).

Table 3 confirms this, showing that the average level of integration is Moderate (Mean = 2.8). This suggests that while technology is present, it is not yet deeply embedded into the core

operational fabric of most businesses. The high adoption of digital payments is a positive sign of financial technology diffusion, but the low rates of automation and precision agriculture highlight significant sector-specific gaps.

Section C: Impact of Innovation and Technology Adoption

Table 4: Perceived Impact of Technology Adoption (Mean Scores on a 5-point scale)

Impact Statement	Mean Score
Improved customer service and engagement	4.2
Increased our productivity	4
Allowed us to reach new markets or customers	3.9
Reduced operational costs	3.5
Led to an increase in sales revenue	3.5
Improved product/service quality	3.4
Enabled creation of new job roles	2.8

The highest perceived impacts are on customer-facing and market expansion activities. This aligns with the high adoption of social media and digital payments, which directly facilitate these outcomes. The increase in productivity is also strongly acknowledged.

Notably, impacts on internal quality and job creation scored lower. The modest score for job creation suggests that initial technology adoption may lead to efficiency gains and role transformation rather than immediate, large-scale employment growth. The qualitative response frequently cited Faster communication with customers and Ability to operate beyond our immediate location as the most significant positive changes.

Barriers to Innovation and Technology Adoption

Table 5: Significance of Barriers to Adoption (Mean Scores on a 5-point scale)

Potential Barrier	Mean Score
Lack of reliable electricity/power supply	4.6
Poor internet connectivity	4.3
Difficulty in accessing loans/funding	4.1
High cost of acquiring new technology	4
Lack of technical skills among staff	3.8
Concerns about cybersecurity	3.2
Resistance to change from staff/management	3
Unsupportive government policies	2.9
Lack of information	2.7

The results unequivocally identify infrastructural and financial constraints as the most crippling barriers. Unreliable power and poor internet are the top two barriers, forming a foundational challenge upon which all other digital efforts are built. The high cost of technology and difficulty in accessing funding directly prevent investment.

Interestingly, Lack of information is the lowest-rated barrier, suggesting that businesses are aware of beneficial technologies but are constrained by infrastructure and capital from acquiring them. The qualitative response overwhelmingly cited Constant power failure and the high cost of fuel for generators as the most critical challenge.

Enablers and Policy Recommendations

Table 6: Preferred Forms of Support for Technology Adoption.

Type of Support	Percentage Preferring (%)
Improved public infrastructure (stable electricity, internet)	95%
Government subsidies or grants for technology purchase	80%
Low-interest loans for tech investment	75%
Training programs for staff on digital skills	60%
Tax incentives for tech-related investments	55%
Better information and advisory services	25%

The demand for support is perfectly aligned with the identified barriers. An overwhelming 95% of businesses call for improved public infrastructure, directly addressing the top barriers from Table 5. Financial interventions like subsidies (80%) and low-interest loans (75%) are the next most desired forms of support, tackling the high cost and funding difficulties.

DISCUSSION OF FINDINGS

Findings of this research reveal a critical distinction between technology access and technology integration. It shows near-saturation levels for foundational, connectivity-oriented technologies. The 98% adoption of internet/email and 92% for social media indicate that businesses recognize the necessity of being connected for basic communication and marketing. The 85% adoption of digital payment systems is a testament to the success of Nigeria's fintech revolution, driven by platforms like Paystack and Flutterwave. However, the sharp decline in adoption for technologies like Business Management Software (35%), E-commerce platforms (28%), and Cloud Computing (20%) points to a significant barrier

beyond simple access. These are process-enhancing technologies that require a higher degree of organizational change, financial investment, and technical skill to implement. The very low adoption of Automation (5%) and Precision Agriculture (5%) signifies that deep technological transformation in the production processes of the manufacturing and agricultural sectors is still in its infancy. Also, a mean score of 2.8 (Moderate) for technology integration suggests that for the average business, technology is a supportive tool rather than a core driver of operations. It is used for specific tasks (like marketing or payments) but has not yet been woven into the entire value chain, from supply chain management to data-driven decision-making. This moderate integration represents a substantial missed opportunity for productivity gains.

The perceived impacts align logically with the types of technologies adopted. The highest mean scores are for customer-centric outcomes: Improved customer service and engagement (4.2) and Reaching new markets (3.9). This is a direct result of the high adoption of social media and digital communication tools, which lower the cost and expand the reach of customer interaction and marketing. The strong agreement with Increased our productivity (4.0) is significant, as it is a core driver of economic growth at the macro level. This self-reported productivity gain likely stems from efficiencies in communication, faster financial transactions, and automated routine tasks. The lower scores for Improved product/service quality (3.4) and Creation of new job roles (2.8) are telling. Improving quality often requires process technologies (like automation or advanced design software) that have low adoption. The modest impact on job creation suggests that the current stage of technology adoption is more about capital-labour substitution (e.g., a digital payment replacing a cashier) or role enhancement than about creating entirely new categories of employment. This is a common phenomenon in the early stages of technological diffusion.

These findings support the endogenous growth theories of Romer (1990), where technology creates positive externalities (like market access). However, they also highlight that for Schumpeterian creative destruction to occur leading to entirely new industries and jobs a more profound level of technological integration is needed than what is currently prevalent. The hierarchy of barriers is stark and informative. The two most significant barriers Lack of reliable electricity (4.6) and Poor internet connectivity (4.3) are fundamental infrastructural issues. They represent a first-order problem that makes all subsequent technological investments riskier and more expensive. A business cannot run a cloud-based ERP system or

an e-commerce platform without stable power and internet; thus, these barriers effectively cap the level of technology sophistication a firm can achieve.

The next tier of barriers is financial: Difficulty in accessing loans/funding (4.1) and High cost of acquiring new technology (4.0). This is particularly acute for the SMEs that dominate the sample, as they lack the capital reserves of larger firms. It is noteworthy that soft barriers like Lack of information (2.7) and Resistance to change (3.0) are rated as less significant. This implies a high level of technology awareness among business owners. They know what technologies exist and see their value, but they are pragmatically constrained by the hard barriers of infrastructure and finance. This is a crucial insight for policymakers: the problem is not a lack of will or awareness, but a lack of enabling conditions. This finding directly corroborates the work of Jegede et al. (2012) and Adetoro (2017), who identified inadequate infrastructure and weak institutional frameworks as primary hindrances to innovation in Nigeria. The results suggest that despite national ICT policies, the on-the-ground environment remains challenging.

The preferences for support are a direct mirror of the barriers identified. The overwhelming demand for Improved public infrastructure (95%) is a clear message to policymakers: solve the power and internet problem first. Without this, other interventions will have a limited impact. The strong preference for financial mechanisms Subsidies or grants (80%) and Low-interest loans (75%) provides a clear roadmap for government and financial institutions. Businesses are not asking for handouts, but for accessible capital to overcome the high initial investment costs.

CONCLUSION

It can be concluded that the lower preference for Training programs and Tax incentives does not mean they are unimportant, but rather that they are seen as secondary to solving the foundational infrastructure and capital problems. Training is ineffective if the computers cannot be powered, and tax incentives are irrelevant if the firm cannot afford the technology in the first place. These recommended interventions align with the policy suggestions often found in the literature emphasizes the state's role in creating a conducive environment for innovation. The results argue for a sequenced policy approach: first, prioritize macro-level infrastructural investments, and second, deploy targeted micro-level financial instruments to stimulate SME adoption. The data obtained paints a picture of a business community in South West Nigeria that is digitally aware and has widely adopted foundational, connectivity-based

technologies. They perceive clear benefits, particularly in customer engagement and market reach. However, the transition to deeper, productivity-focused technology integration is severely hampered by external constraints, primarily unreliable infrastructure (power, internet) and a lack of accessible financing. Therefore, it is recommended that policy efforts focused solely on promoting digital literacy or providing information will be insufficient unless they are coupled with, and perhaps preceded by, decisive action to solve the foundational issues of electricity and internet connectivity, alongside financial de-risking mechanisms for SMEs.

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