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SECTORAL PATTERNS AND CONSTRAINTS OF DIGITAL EMPLOYMENT IN EMERGING MARKETS: EVIDENCE FROM NIGERIA

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Abstract *This study examined the influence of digital skills, infrastructure adequacy, platform ecosystem quality, and digital technology adoption on employment outcomes within Nigeria's e-commerce and fintech sectors. Using a cross-sectional survey of 407 MSMEs and digital platform agents, the study employed descriptive statistics, Chi-square tests, independent-samples* t*-tests, and a log-linear multiple regression model to analyse the determinants of digital employment generation. The results revealed significant sectoral differences in employment characteristics, with fintech enterprises recording higher proportions of formal and full-time employment than e-commerce enterprises. The independent-samples* t*-test further showed that fintech firms reported significantly higher employment outcomes than e-commerce firms (*t*(405) = 4.25,* p *< .001). The regression results indicated that digital skills (β = 0.150,* p *< .001), infrastructure adequacy (β = 0.082,* p *= .008), platform ecosystem quality (β = 0.118,* p *= .001), e-commerce adoption (β = 0.301,* p *< .001) and fintech adoption (β = 0.243,* p *< .001) exert positive and statistically significant effects on employment outcomes. The model explained 66.4% of the variation in employment outcomes (Adjusted* R^2 *= 0.664) and satisfied key diagnostic tests for multicollinearity, heteroskedasticity, normality and autocorrelation. The study concludes that strengthening digital capabilities, improving infrastructure, enhancing platform ecosystem quality and promoting digital technology adoption are critical for expanding sustainable employment opportunities within Nigeria's digital economy. The study recommends targeted investments in digital infrastructure and digital skills development, improvements in platform ecosystem governance, wider adoption of e-commerce and fintech technologies, and expanded access to digital finance through a more enabling regulatory environment to promote inclusive and sustainable employment growth.*

Keywords Digital employment, E-commerce, Fintech, Digital skills, Infrastructure adequacy

JEL Classification Codes: J21, J24, O33, L81, G20

INTRODUCTION

Digitalization has become a key driver of structural transformation in emerging economies, reshaping production, labour markets, and value creation. In Nigeria, rapid digital adoption continues despite infrastructural and institutional challenges. The National Digital Economy Policy and Strategy (NDEPS) 2020–2030 prioritizes digital technology to promote economic diversification, employment generation, and productivity. Reflecting this progress, the ICT and telecommunications subsector contributed 19.78% to Nigeria's real GDP in the second quarter of 2024 (National Bureau of Statistics, 2024).

A key feature of Nigeria's digital expansion is the rapid growth of e-commerce, fintech, and platform-based services. These technologies improve market access for MSMEs, reduce transaction costs, and support innovative business models across multiple sectors. Fintech has enhanced financial inclusion through mobile payments, agent banking, and digital credit, thereby promoting entrepreneurship, enterprise growth, and employment opportunities within the digital economy (Nigerian Communications Commission [NCC], 2025).

Despite the rapid expansion of Nigeria's digital economy, youth employment remains a major development concern. According to the National Bureau of Statistics (2024), the unemployment rate among young people aged 15–24 years was 6.5% in the second quarter of 2024 under the revised labour force methodology, highlighting the continued need for policies that promote sustainable employment opportunities, particularly within digitally enabled sectors.

Existing studies provide useful insights but remain limited in scope. Ezie *et al.* (2025) found that fintech penetration contributes to reducing unemployment in Nigeria, although their macro-level analysis did not capture sectoral or firm-level employment dynamics. Likewise, Popoola *et al.* (2024) identified inadequate infrastructure, digital skills shortages, high operating costs, and regulatory bottlenecks as major constraints limiting digital enterprise expansion and sustainable employment generation.

The literature provides limited evidence on sectoral differences in digital employment outcomes in Nigeria. While fintech predominantly creates high-skill jobs, sectors such as retail and logistics rely more on platform-based and flexible work arrangements. Furthermore, firm-level factors, including digital skills, technology access, regulatory conditions, and infrastructure, remain underexplored. Most existing studies emphasize productivity or aggregate economic performance rather than employment generation within digital enterprises, leaving an important empirical gap (Adeleke & Adeleke, 2023).

Given these gaps, there is a need for firm-level evidence on the determinants of digital employment in Nigeria. Examining sector-specific characteristics and worker experiences is essential for understanding how digital transformation influences employment and the constraints to inclusive job creation. This study addresses this gap by providing empirical evidence on

employment outcomes within Nigeria's e-commerce and fintech sectors, thereby informing policies that support sustainable digital employment (Ashiru et al., 2023).

Objectives of the Study

This study examines the sectoral patterns and structural determinants of digital employment in Nigeria using firm-level primary data. The specific objectives are to:

1. analyze sectoral differences in employment outcomes (formal vs informal, full-time vs part-time) associated with e-commerce vs fintech segments;
2. assess the influence of digital skills, infrastructure and platform ecosystem quality on employment outcomes, and
3. identify the major constraints and enabling factors, that influence the creation and sustainability of digital employment across e-commerce and fintech sectors.

Research Hypotheses

The following hypotheses were formulated for the study:

H_{01}: There is no significant difference in digital employment outcomes across key sectors of Nigeria's digital economy in terms of formality, job stability and work intensity.

H_{02}: Digital skills, infrastructure and platform ecosystem quality do not have significant influence on employment outcomes.

Scope and Delimitation of the Study

This study examines sectoral patterns and constraints of digital employment in Nigeria, focusing on Abuja, Lagos, Port Harcourt, and Kaduna, selected for their vibrant digital ecosystems. It is limited to primary data from firms, platform workers, agents, and digital service providers engaged in e-commerce and fintech. Rural digital activities and other ICT subsectors are excluded to provide a focused analysis of employment patterns, sectoral differences, and structural constraints.

LITERATURE REVIEW

Conceptual Framework

This study's conceptual framework examines how the digital economy, digital platforms and digital skills influence employment generation and labour market outcomes across Nigeria's digital sectors.

Digital Economy

The digital economy comprises technology-enabled economic activities driven by digital infrastructure, data, and online platforms. In Nigeria, it encompasses telecommunications, fintech, e-commerce and digital services that increasingly support employment generation (OECD, 2024; FMCDE, 2020).

Digital Platforms and Online Labour Markets

Digital platforms connect businesses, workers, and consumers through digital interfaces, reducing transaction costs and expanding opportunities for e-commerce,

gig work, remote work, and digital entrepreneurship (UNCTAD, 2024). In Nigeria, platforms such as Jumia, Bolt, Glovo, Upwork, and OPay have broadened employment opportunities in logistics, retail, financial services, and professional freelancing (NITDA, 2024).

Digital Skills and Human Capital

Digital skills comprise the competencies required to use digital technologies effectively for productive work, ranging from basic digital literacy to advanced ICT and data-related capabilities (World Bank, 2023). In Nigeria, inadequate digital skills constrain participation in digital employment, particularly among youth and MSMEs (FMCDE, 2020). Sustained investment in digital skills development is therefore essential for promoting inclusive and sustainable participation in the digital labour market (ILO, 2024).

Employment Generation

Employment generation refers to creating productive jobs that improve incomes and well-being. In the digital economy, it includes platform work, digital entrepreneurship, ICT occupations, and online freelancing, supporting inclusive economic transformation (World Bank, 2023; ILO, 2024).

Figure 1: Conceptual Framework of the Study

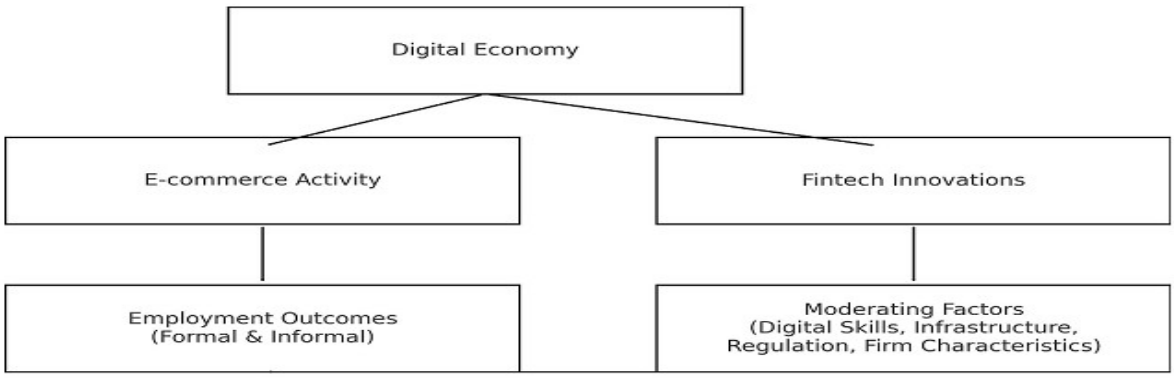


Figure 1 illustrates how e-commerce and fintech drive employment generation through digital trade, financial services, and platform activities. Their employment effects are moderated by digital skills, infrastructure, regulations and firm characteristics. The framework demonstrates that a supportive digital ecosystem strengthens sustainable and inclusive job creation within Nigeria's emerging digital economy.

Theoretical Framework

This study is anchored on Schumpeterian Innovation Theory, Human Capital Theory, and the Technology Acceptance Model (TAM), which explain how innovation, digital skills, and technology adoption

influence employment outcomes across Nigeria's digital economy.

Schumpeterian Innovation Theory

Schumpeterian Innovation Theory (Schumpeter, 1934, 1942) posits that innovation drives economic development through "creative destruction," replacing inefficient technologies and business models with more productive ones. In Nigeria, fintech and e-commerce exemplify disruptive innovations that are transforming banking, trade and service delivery while creating new employment opportunities in digital retail, logistics, mobile money and online services. The theory explains how technological innovation reshapes sectoral employment patterns and job creation.

Human Capital Theory

Human Capital Theory (Becker, 1964) posits that investments in education, training, and skills enhance productivity and employability. Within Nigeria's digital economy, digital literacy, ICT competence and entrepreneurial skills are critical for accessing and sustaining employment in technology-driven sectors. The theory explains how differences in human capital influence workers' and firms' capacity to participate effectively in digital activities and generate sustainable employment outcomes.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1989), explains technology adoption through perceived usefulness and perceived ease of use. The model suggests that individuals and firms are more likely to adopt digital technologies they consider beneficial and user-friendly. In Nigeria's digital economy, adoption of e-commerce platforms, mobile payment systems, and digital applications influences business growth and employment opportunities. However, inadequate infrastructure, complex systems, and regulatory barriers may hinder adoption. TAM therefore provides a useful framework for explaining how digital technology adoption shapes employment outcomes across Nigeria's e-commerce and fintech sectors.

Integration of theoretical perspectives

The Schumpeterian Innovation Theory, Human Capital Theory and Technology Acceptance Model collectively provide the theoretical foundation for this study. Together, they explain how digital innovation, human capital and technology adoption drive employment creation. The integrated framework demonstrates that digital skills, infrastructure, platform ecosystem quality and technology adoption jointly influence employment outcomes by enhancing firms' productivity, competitiveness and capacity to generate sustainable jobs within Nigeria's e-commerce and fintech sectors.

Empirical Review

Empirical evidence on digital employment in Nigeria remains limited, particularly regarding sectoral differences and employment constraints. The International Labour Organization (2021) found that digital labour platforms have expanded employment opportunities for youth and micro-enterprises across Sub-

Saharan Africa. However, inadequate digital skills, weak infrastructure, limited financial inclusion and regulatory challenges continue to constrain the employment potential of the digital economy, highlighting key barriers to inclusive digital job creation.

The World Bank (2021) reported that digital technologies can stimulate employment and enterprise growth in Africa by expanding market access, entrepreneurship and financial inclusion. However, these benefits depend on improved digital infrastructure, workforce skills, and supportive regulatory policies. Similarly, Ezie *et al.* (2023) found that internet and mobile payment transactions significantly enhanced Nigeria's economic growth, although Instant Pay transactions had a negative effect. While their FMOLS analysis demonstrates the macroeconomic importance of fintech adoption, it relies on aggregate national data and does not capture firm-level employment dynamics. This study addresses that gap by providing micro-level evidence on how digital technologies influence employment outcomes across Nigeria's e-commerce and fintech sectors.

Egunjobi (2023, published in 2025) found that ICT adoption, e-commerce participation and digital entrepreneurship significantly enhanced job creation and market access among small businesses in Lagos State. However, its focus on a single state and broad digital entrepreneurship limits its applicability to sectoral employment differences across Nigeria. Similarly, Anyionu *et al.* (2025) reported that social media-based electronic marketing significantly improved employment opportunities among unemployed youths in Enugu State. Nevertheless, the study concentrated on informal digital entrepreneurship and did not distinguish between formal and informal employment or compare employment outcomes across digital sectors. These limitations justify the present study's multi-city, firm-level analysis of employment generation and sectoral differences between Nigeria's e-commerce and fintech industries.

Fadeyi *et al.* (2025) examined the impact of digital financial service adoption on SME performance in Lagos State and found that digital financial services significantly improved operational efficiency, competitiveness and access to finance. However, the study focused on business performance rather than employment outcomes and identified inadequate internet connectivity, cybersecurity concerns and limited digital capabilities as key barriers to digital adoption. Similarly, Popoola *et al.* (2024) investigated the sustainability of Nigeria's digital economy and identified inadequate digital skills, weak infrastructure, gender disparities and regulatory challenges as major constraints to sustainable digital employment. Although the study emphasized policy reforms to improve digital job quality and quantity, it did not provide sector-specific evidence comparing employment outcomes across e-commerce and fintech enterprises. The present study addresses this gap through firm-level analysis of employment generation while accounting for digital skills, infrastructure adequacy and platform ecosystem quality.

Etuk *et al.* (2025) examined the determinants of mobile FinTech adoption among users in Calabar, Nigeria, using the

Unified Theory of Acceptance and Use of Technology (UTAUT). The study found that performance expectancy, effort expectancy, social influence, and facilitating conditions significantly influenced FinTech adoption. Although employment outcomes were not examined, the findings highlight the importance of digital skills, infrastructure, and enabling conditions for technology adoption. Overall, existing studies show that digital transformation promotes employment through technology adoption, financial inclusion, and digital entrepreneurship. However, inadequate infrastructure, limited finance, regulatory constraints, and digital skills gaps continue to restrict these benefits. More importantly, little empirical evidence exists on the combined effects of digital skills, infrastructure, platform ecosystem quality, e-commerce adoption and fintech adoption on employment outcomes in Nigerian digital enterprises, justifying the present study.

METHODOLOGY

Research Design

This study adopted a descriptive and explanatory survey design to examine sectoral patterns and determinants of digital employment in Nigeria. The design enabled the description of employment structures and the analysis of relationships between digital-sector participation, digital skills, infrastructure and employment outcomes using primary data collected from firms and digital platform participants.

Study Area

The study was conducted in Abuja, Kaduna, Lagos and Port Harcourt, selected for their prominent roles in Nigeria's digital economy. These cities represent major fintech, e-commerce and technology hubs, providing broad regional and sectoral coverage for analysing digital employment patterns and related labour-market dynamics.

Population of the Study

The study population comprised firms and individuals engaged in Nigeria's digital economy, including e-commerce and fintech employees, platform workers, online vendors, digital freelancers, logistics operators, mobile-money agents and customer-support personnel.

Sample Size and Sampling Technique

A total of 440 respondents participated in the study, 110 from each study location, to ensure balanced geographic representation and statistical robustness. A multistage sampling strategy was employed. First, the four cities were purposively selected due to their relevance to digital economic activities. Second, respondents within each city were stratified into two primary digital sectors: e-commerce and fintech. Finally, participants were selected through simple random sampling within each stratum to ensure an unbiased distribution of digital workers and firms across the study areas. Although equal numbers of respondents were selected from each study city to facilitate meaningful inter-city comparisons, this allocation is not proportional to the actual distribution of digital enterprises across Nigeria. Consequently, larger digital markets, particularly Lagos, may be relatively underrepresented, while smaller markets may be comparatively

overrepresented. Accordingly, the findings should be interpreted as reflecting balanced regional comparisons rather than proportional national estimates.

Instrument for Data Collection, its Validity and Reliability

Primary data were collected using a structured questionnaire comprising four sections:

1. Section A: Socio-demographic characteristics of respondents.
2. Section B: Participation in e-commerce activities and related job characteristics.
4. Section C: Engagement in fintech operations and digitally enabled financial services.
5. Section D: Employment outcomes, sectoral patterns and constraints affecting digital work (skills, infrastructure, regulation and platform ecosystem quality).

Perception-based items were measured on a five-point Likert scale. A pilot test involving 30 respondents in Kano confirmed clarity and improved the instrument's reliability. Content validity was established through expert review involving three scholars specializing in digital labour markets and quantitative research. Reliability was assessed using Cronbach's Alpha, and all scales achieved coefficients above 0.80, indicating high internal consistency suitable for inferential analysis.

Ethical Considerations

The study followed accepted ethical standards for social science research. Participation was voluntary, informed consent was obtained and respondents' anonymity and confidentiality were protected. Data were used solely for academic purposes. As the study involved a non-invasive survey of adults without sensitive personal data, formal institutional ethical approval was not required.

Method of Data Collection

Data were collected through both physical and electronic questionnaires to maximize respondent coverage, particularly among online participants, with trained research assistants ensuring consistent administration. The data were coded and analysed using SPSS version 31 and STATA version 19. Descriptive statistics summarized respondent characteristics and employment patterns, while Chi-square tests examined associations between employment types and digital sectors. Independent-samples t-tests compared employment outcomes across e-commerce and fintech sectors and multiple regression analysis assessed the effects of digital skills, infrastructure adequacy and platform ecosystem quality on employment outcomes.

Model Specification

A log-linear multiple regression model was employed to examine the effects of digital skills, infrastructure adequacy, platform ecosystem quality, e-commerce adoption, fintech adoption and firm characteristics on employment outcomes. Because the employment variable exhibited positive skewness, it was transformed as ln(Employment + 1) to stabilize variance and retain zero values. Diagnostic tests confirmed that the model satisfied key

Ordinary Least Squares assumptions, including the absence of serious multicollinearity, heteroskedasticity and autocorrelation, with residuals approximating normality. The log-linear specification was therefore considered appropriate for the analysis.

The estimated model is specified as:

$$\ln(EMG_OUT_i + 1) = \beta_0 + \beta_1 SKIL_i + \beta_2 INFRA_i + \beta_3 PLAT_i + \beta_4 \ln(ECOM_i) + \beta_5 \ln(FIN_i) + \beta_6 CTRL + \varepsilon_i$$

The log-linear model was adopted to address skewness, reduce the influence of extreme values and satisfy OLS assumptions. Only the dependent variable and continuous adoption variables (e-commerce and fintech) were log-transformed, while the composite indices for digital skills, infrastructure adequacy and platform ecosystem quality remained in their original scales.

Where:

i = Respondents, firms, or platform agents included in the cross-sectional survey.

ln = Natural logarithm applied to the dependent variable and selected continuous monetary variables to reduce skewness, stabilize variance, and improve model fit.

EMG_OUT = Employment outcome (dependent variable), measured as the total number of net jobs created by the firm or respondent during the preceding 12 months. The transformation **ln(EMG_OUT + 1)** was used to reduce positive skewness and accommodate observations with zero job creation.

SKILL = Digital Skills Index, computed as the mean score of five Likert-scale items ranging from 1 = Not skilled at all to **5 =** Highly skilled.

INFRA = Infrastructure Adequacy Index, measured as the average score for electricity reliability, internet quality, and mobile network performance on a five-point Likert scale (1 = Very inadequate to 5 = Very adequate).

PLAT = Platform Ecosystem Quality Index representing the quality of the digital platform ecosystem, constructed from platform participation, transaction activity, platform support services, and perceived platform governance.

ECOM = E-commerce adoption intensity, proxied by the average monthly value of online sales (₦) and entered in natural logarithmic form.

FIN = Fintech adoption level, measured by the monthly value of digital financial transactions (₦) and entered in natural logarithmic form.

CTRL = represents firm size, firm age, education, legal status, sector, city and access to credit. Continuous variables were retained in their observed form, while categorical variables were entered as dummy variables.

β_0 = Constant (intercept).

β_1–β_6 = represent the estimated effects of each explanatory variable on the logged employment outcome, holding other factors constant. Coefficients for logged adoption variables are interpreted as elasticities.

ε = Random error term.

RESULTS AND DISCUSSION

Differences in Employment Outcomes across E-Commerce Vs Fintech Segments

Of the 440 questionnaires distributed, 407 were valid, yielding a 92.5% response rate. Table 1 compares employment types across Nigeria's e-commerce and fintech sectors. The results indicate that e-commerce is dominated by informal and gig-based jobs, whereas fintech records a higher proportion of formal employment. This pattern reflects the more regulated and institutionally structured nature of fintech compared with the flexible employment arrangements prevalent in e-commerce.

Table 1: Cross-Tabulation of Employment Type (Formal vs. Informal) by Digital Sector (E-commerce and Fintech), N = 407

Sector	Formal (n, %)	Informal (n, %)	Row total
E-commerce (n = 240)	84 (35.0%)	156 (65.0%)	240
Fintech (n = 167)	79 (47.3%)	88 (52.7%)	167
Total	**163 (40.0%)**	**244 (60.0%)**	**407**

Source: Field Survey, 2025
Note: Pearson's $\chi^2(1, N = 407) = 5.86$, $p = .015$; Cramer's $V = 0.12$, indicating a small effect size.

The Pearson Chi-square test revealed a significant association between employment type and digital sector ($\chi^2(1, N = 407) = 5.86$, $p = .015$). Although the effect size was small (Cramer's V = 0.12), fintech recorded a higher proportion of formal employment (47.3%), while e-commerce was dominated by informal employment (65.0%), indicating distinct employment structures across the two sectors.

The sectoral differences reflect the distinct operational characteristics of the two industries. Fintech firms operate within regulated financial systems requiring licensing, KYC compliance and structured organisational processes, which encourage formal employment. In contrast, e-commerce businesses rely more on flexible arrangements involving online vendors, delivery personnel and gig workers. This finding agrees with the International Labour Organization (2024), which reported that fintech generally creates more formal jobs than e-commerce in Sub-Saharan Africa. However, the small effect size suggests that employment formality is also influenced by firm-specific factors, including enterprise size, digital capability and infrastructure.

Table 2 compares full-time and part-time employment across the e-commerce and fintech sectors. The analysis assesses whether work arrangements differ significantly between the two industries, providing insight into employment quality

and stability. Given their stronger regulatory and organisational structures, fintech firms are expected to offer more full-time jobs than the typically flexible, task-based e-commerce sector.

Table 2: Cross-tabulation of Work Arrangement by Sector (N = 407): Full-time versus Part-time Employment among E-commerce and Fintech Workers

Sector	Full-time (n, %)	Part-time (n, %)	Row total
E-commerce (n = 240)	125 (52.1%)	115 (47.9%)	240
Fintech (n = 167)	111 (66.5%)	56 (33.5%)	167
Total	**236 (58.0%)**	**171 (42.0%)**	**407**

Source: Field Survey, 2025

Note: Pearson's $\chi^2(1, N = 407) = 7.98$, $p = .005$; Cramer's $V = 0.14$, indicating a small-to-moderate effect size.

The Pearson Chi-square test showed a significant association between work arrangement and digital sector ($\chi^2(1, N = 407) = 7.98$, $p = .005$). Although the effect size was small-to-moderate (Cramer's V = 0.14), fintech firms reported more full-time employment (66.5%), whereas part-time work was more common in the e-commerce sector (47.9%).

The higher prevalence of full-time employment in fintech reflects its regulated operating environment. Compliance with licensing requirements, KYC procedures, anti-money laundering regulations, cybersecurity standards, and customer support obligations requires permanent staff, including compliance officers, software developers, and customer service personnel. Conversely, e-commerce businesses depend more on independent vendors, delivery riders, digital marketers, and other demand-driven service providers, resulting in greater reliance on part-time and gig-based work. This finding is consistent with the International Labour Organization (2021, 2024), which reported that digital labour platforms predominantly generate flexible employment, whereas regulated digital financial services support more stable work arrangements. However, the modest effect size suggests that work arrangements are also shaped by organisational characteristics such as firm size, business model, workforce composition and the broader business environment.

Comparison of Mean Employment Outcomes between E-commerce and Fintech Sectors

Table 3 presents the independent samples t-test result which indicates a statistically significant difference in mean employment generation between e-commerce and fintech firms, $t(405) = 4.25$, $p < .001$. On average, fintech firms ($M = 2.38$, $SD = 0.75$) demonstrate higher employment generation than e-commerce firms ($M = 2.05$, $SD =$

0.80), with a mean difference of 0.33 (95% CI [0.18, 0.48]).

Table 3: Independent Samples t-Test Comparing Mean Log-Transformed Employment Outcomes between E-commerce and Fintech Firms (N = 407)

Sector	Mean ln(Employment + 1)	SD	Mean Difference	t(df)	p-value	95% CI for Mean Difference
E-commerce (n = 240)	2.05	0.80	—			
Fintech (n = 167)	2.38	0.75	0.33	4.25(405)	<.001	(0.18, 0.48)

Source: Field Survey, 2025

Note: Employment outcome was transformed using ln(Employment + 1) prior to analysis to reduce positive skewness and accommodate firms reporting zero net jobs created during the reference period.

The independent-samples t-test (Table 3) revealed a significant difference in mean log-transformed employment outcomes between e-commerce and fintech firms ($t(405) = 4.25$, $p < .001$). Fintech firms recorded a higher mean employment outcome ($M = 2.38$, $SD = 0.75$) than e-commerce firms ($M = 2.05$, $SD = 0.80$), with a mean difference of 0.33 (95% CI [0.18, 0.48]). Back-transformed values indicate that fintech firms generated approximately 9.8 jobs compared with 6.8 jobs among e-commerce firms, representing about 39% higher employment. These descriptive estimates should not be interpreted as causal effects. The findings support evidence that fintech's stronger regulatory framework and integration with financial services promote greater employment generation than the more flexible, gig-oriented e-commerce sector (Owolabi & Adeleke, 2024; World Bank, 2024).

Influence of Digital Skills, Infrastructure and Platform ecosystem quality on Employment Outcomes

Table 4 presents the estimates of the log-linear regression model examining the determinants of employment outcomes among e-commerce and fintech enterprises in Nigeria. The model demonstrates strong explanatory power, explaining approximately 66.4% of the variation in employment outcomes (Adjusted $R^2 = 0.664$). The overall model is statistically significant ($F = 136.40$, $p < .001$). Diagnostic tests further confirm the robustness of the estimates, with no evidence of serious multicollinearity (mean VIF = 2.1; all VIFs < 3), heteroskedasticity (Breusch–Pagan $\chi^2(6) = 7.12$, $p = .313$), non-normal residuals (Jarque–Bera = 2.45, $p = .293$), or autocorrelation (Durbin–Watson = 1.96).

Table 4: Determinants of Employment Outcomes (N = 407)

Variable	Coefficient	Std. Error	T-value	P-value	VIF
Intercept	0.421	0.093	4.52	0.000	--
Digital skills index	0.150	0.037	4.05	0.000	1.9
Infrastructure adequacy	0.082	0.031	2.65	0.008	1.8
Platform ecosystem quality index	0.118	0.036	3.28	0.001	2.2
E-commerce adoption	0.301	0.045	6.69	0.000	2.7
Fintech adoption	0.243	0.041	5.93	0.000	2.3
Control vector	0.049	0.026	1.88	0.061	1.6
Model summary statistics:					
R-squared	0.676				
Adjusted R-squared	0.664				
F-statistic	136.4				
Prob(F-statistic)	0.001				
Durbin-Watson statistic	1.96				
Mean VIF	2.1 (all VIFs < 3)				
Breusch–Pagan test	$\chi^2(6) = 7.12$, $p = 0.313$ (no heteroskedasticity)				
Jarque–Bera JB = 2.45,	$p = 0.293$ (residuals approximately normal)				

Source: Field Survey, 2025 VIF = Variance Inflation Factor

Digital skills had a positive and statistically significant effect on employment outcomes ($\beta = 0.150$, $p < .001$). A one-point increase in the digital skills index was associated with a 0.150-unit rise in the log of employment outcomes, equivalent to an approximate 16.2% increase, highlighting the importance of digital competencies for enterprise growth and job creation. Similarly, infrastructure adequacy significantly improved employment outcomes ($\beta = 0.082$, $p = .008$). A one-point improvement in infrastructure corresponded to an estimated 8.5% increase in employment, indicating that reliable electricity, internet connectivity, and mobile networks enhance firms' capacity to expand operations and create jobs. These findings are consistent with the International Labour Organization (2024), the World Bank (2023), and Popoola et al. (2024), which emphasize digital skills and infrastructure as critical drivers of sustainable digital employment.

Platform ecosystem quality positively and significantly influenced employment outcomes ($\beta = 0.118$, $p = .001$). A one-point improvement in platform ecosystem quality was associated with an estimated 12.5% increase in employment outcomes, indicating that effective platform governance, efficient transactions, and strong seller support promote enterprise growth and job creation. Similarly, e-commerce adoption ($\beta = 0.301$, $p < .001$) and fintech adoption ($\beta = 0.243$, $p < .001$) exerted positive and highly significant

effects on employment. As these variables were log-transformed, their coefficients represent elasticities: a 1% increase in e-commerce and fintech adoption was associated with approximately 0.301% and 0.243% increases in employment outcomes, respectively. These findings suggest that greater adoption of digital technologies expands market access, improves operational efficiency and stimulates labour demand, consistent with UNCTAD (2024) and Ezie *et al.* (2023).

Finally, the control variables were jointly positive but not statistically significant (β = 0.049, p = .061). Although they did not independently explain variations in employment outcomes at the conventional 5% significance level, they were retained in the model to improve model specification and minimise omitted-variable bias. Collectively, the findings demonstrate that digital capabilities, enabling infrastructure, platform ecosystem quality, and the adoption of digital technologies are key drivers of employment generation within Nigeria's digital economy

Perceived Constraints and Facilitators of Digital Employment Generation

Table 5 summarizes respondents' perceptions of factors influencing digital employment. The findings identify inadequate infrastructure (32%) and limited access to finance (28%) as the main constraints, while improved digital skills (24%) and supportive policies (16%) were viewed as key facilitators. These results highlight the contextual factors shaping employment across Nigeria's e-commerce and fintech sectors.

Table 5: Perceived Constraints and Facilitators of Digital Employment Generation (N = 407)

Variable (1–5 Likert Scale)	Mean	SD	Interpretation	Rank
Digital skills of workforce	4.12	0.82	High facilitator	1
Internet reliability	3.36	0.97	Moderate facilitator	2
Electricity supply stability	3.54	1.10	Moderate facilitator	3
Regulatory support for digital business	3.22	0.88	Mild facilitator	4
Cost of digital tools/platforms	2.91	1.05	Moderate constraint	5
Cybersecurity and fraud risks	2.67	0.91	Moderate constraint	6
Access to finance/credit	2.44	0.94	Strong constraint	7
Logistics and delivery infrastructure	2.36	0.99	Strong constraint	8
Taxation and compliance burdens	2.18	0.85	Strong constraint	9

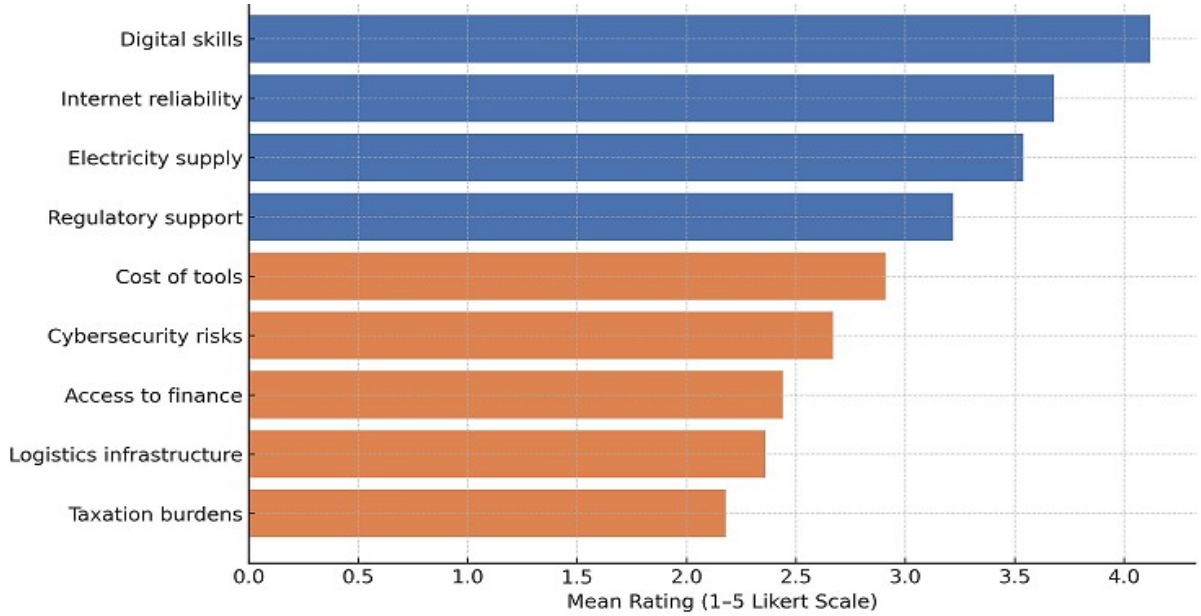
Source: Field Survey, 2025 **Scale:** 1 = Strong constraint, 5 = Strong facilitator

Note: Rankings are based on the mean scores of respondents' ratings. Higher mean scores represent stronger facilitating factors, whereas lower mean scores indicate stronger perceived constraints, consistent with the response scale (1 = Strong Constraint; 5 = Strong Facilitator).

Table 5 ranks the factors based on their mean scores, with higher values indicating stronger facilitators of digital employment. Digital skills recorded the highest mean (M = 4.12, SD = 0.82), followed by internet reliability (M = 3.36, SD = 0.97), underscoring their importance for employment growth. Electricity supply and regulatory support also contributed positively, although their effects were less pronounced than those of digital skills and reliable internet connectivity.

Conversely, taxation and compliance burdens (M = 2.18, SD = 0.85), logistics infrastructure (M = 2.36, SD = 0.99) and access to finance (M = 2.44, SD = 0.94) recorded the lowest mean scores, identifying them as the major constraints to digital employment generation. Their scores below the scale midpoint indicate that respondents generally viewed these factors as barriers to business expansion and job creation. These findings align with the Small and Medium Enterprises Development Agency of Nigeria and National Bureau of Statistics (2021) National MSME Survey and Popoola *et al.* (2024), which identified limited finance, infrastructure deficiencies and regulatory challenges as key obstacles to digital enterprise growth and employment.

Figure 1: Mean ratings of perceived constraints and facilitators of digital employment generation among e-commerce and fintech firms in Nigeria



Note: Higher mean scores indicate stronger facilitating effects, whereas lower mean scores indicate stronger perceived constraints (1 = Strong Constraint; 5 = Strong Facilitator).

Test of Research Hypotheses

The findings provide sufficient evidence to reject both null hypotheses. For H_{01}, the independent-samples t-test revealed a significant difference in employment outcomes between e-commerce and fintech

enterprises ($t(405) = 4.25$, $p < .001$), with fintech firms generating higher employment. This indicates that sectoral characteristics significantly influence employment outcomes within Nigeria's digital economy. For H_{02}, the regression results showed that digital skills ($\beta = 0.150$, $p < .001$), infrastructure adequacy ($\beta = 0.082$, $p = .008$), platform ecosystem quality ($\beta = 0.118$, $p = .001$), e-commerce adoption ($\beta = 0.301$, $p < .001$), and fintech adoption ($\beta = 0.243$, $p < .001$) all positively and significantly affected employment outcomes. Accordingly, both null hypotheses were rejected.

Conclusion

The study concludes that Nigeria's e-commerce and fintech sectors have substantial potential to generate sustainable employment. Digital skills, infrastructure adequacy, platform ecosystem quality and technology adoption significantly enhance employment outcomes, while fintech enterprises create relatively more employment than e-commerce firms. These findings indicate that strengthening digital capabilities, expanding reliable infrastructure, improving platform governance and addressing institutional constraints are critical for promoting inclusive, sustainable and high-quality employment within Nigeria's digital economy.

Recommendations

1. **Strengthen Digital Infrastructure:** The Federal Government, in partnership with state governments and private-sector stakeholders, should expand reliable electricity and broadband infrastructure within major digital enterprise clusters. Investments in renewable energy and high-speed internet will reduce operational constraints, enhance business productivity and support sustainable digital employment.

2. **Expand Digital Skills Development:** The Federal Ministry of Communications, Innovation and Digital Economy, in collaboration with NITDA and training institutions, should implement continuous digital skills programmes for MSMEs, platform workers and young entrepreneurs, emphasizing e-commerce, fintech, cybersecurity, digital business management and data analytics.

3. **Enhance Platform Ecosystem Quality:** Digital platform providers should strengthen seller support, dispute resolution, digital security and business analytics, while regulatory agencies promote transparent platform governance. These measures will improve platform efficiency, encourage enterprise expansion and foster innovation-driven employment growth.

4. **Promote Digital Technology Adoption:** Government agencies, financial institutions and private-sector partners should provide incentives, technical support and awareness programmes to increase MSME adoption of e-commerce and fintech technologies, thereby improving market access, operational efficiency, business competitiveness and employment generation.

5. **Expand Digital Finance and Simplify Regulation:** The Central Bank of Nigeria, the Bank of Industry and other development finance institutions should expand affordable digital financing for MSMEs, while government agencies simplify taxation, business registration, and regulatory compliance through integrated digital platforms to encourage enterprise growth and formal employment.

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