PAJRI
PAN-AFRICAN JOURNAL OF RESEARCH AND INNOVATION

Pan-African Journal of Research and Innovation in Business, Finance and Management

ISSN: 3413-9431 | Vol. 1, Issue 1 | www.pajri.com | DOI: https://doi.org/10.0000/0000

Payment Interoperability and Cross-Border SME Trade in Africa: The Roles of Transaction Efficiency, Regulatory Fragmentation and Transaction Costs

[1]Raymond Dumeh, [2]Lucy Agyepong

[1,2]Department of Business Administration and Communication Arts, Academic City University College, Accra, Ghana

*Corresponding author: raymond.dumeh@acity.edu.gh

Received:2026-09-08	Accepted: 2026-09-12	Published: 2026-09-14

ABSTRACT

The realization of regional economic integration across emerging markets depends not merely on statutory tariff reductions, but on the operational efficiency of the digital financial rails connecting cross-border enterprises. Within the African Continental Free Trade Area (AfCFTA), small and medium-sized enterprises (SMEs) face persistent financial and institutional friction. While macro-level payment innovations: such as the Pan-African Payment and Settlement System (PAPSS): have established continental financial market infrastructure, international business scholarship lacks firm-level empirical evidence on how payment interoperability translates into actual cross-border commercial engagement. Grounded in Transaction Cost Economics (TCE) and Institutional Theory, this study develops an empirical model explaining how payment interoperability influences cross-border SME transaction intensity and firm trade performance. We conceptualize payment interoperability as an intermediate technological capability that impacts trade performance through the mediating mechanism of transaction efficiency, while regulatory fragmentation acts as a critical institutional moderator. Analyzing a cross-sectional dataset of N=702 SMEs across five key African trade hubs (Ghana, Nigeria, Côte d'Ivoire, Kenya, and South Africa) using Partial Least Squares Structural Equation Modeling (PLS-SEM), the study disentangles technological capabilities from firm-level trade performance. Out-of-sample predictive assessment (PLSpredict) and Gaussian copula diagnostics evaluate structural robust predictions and endogeneity risks. The findings advance digital trade literature by establishing the boundary conditions under which digital financial infrastructure translates into practical firm-level trade performance under AfCFTA.

KEYWORDS: Payment Interoperability, Cross-Border Payments, SMEs, AfCFTA, PAPSS, Transaction Cost Economics, Institutional Theory, PLS-SEM.

OPEN ACCESS
This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International Licence (CC BY 4.0).

1. Introduction

Africa's ambition to deepen regional economic integration increasingly depends on the ability of firms to transact across national borders with fewer financial, institutional, and logistical frictions (African Union, 2018; World Bank, 2025). The African Continental Free Trade Area (AfCFTA) represents one of the continent's most significant attempts to establish an integrated market by reducing tariff barriers and creating a common framework for continental commerce (UNCTAD, 2021). Nevertheless, formal trade liberalisation does not automatically remove the operational frictions encountered by firms when purchasing from, selling to, or paying business partners in other African countries (Beck et al., 2005; World Economic Forum, 2023).

The scale of the opportunity is substantial. UNCTAD's (2024) Economic Development in Africa Report highlights stronger intra-African trade and regional value chains as vital mechanisms for improving Africa's economic resilience and diversification. Yet, intra-African trade accounts for approximately 16% of Africa's total trade, illustrating significant scope for deeper regional integration (UNCTAD, 2024). Infrastructure gaps, non-tariff barriers, regulatory differences, and payment connectivity constraints continue to restrict regional integration (BIS, 2024; Financial Stability Board [FSB], 2023).

Financial connectivity represents a critical constraint. Trade requires not only that a buyer and seller can identify each other and move goods across borders, but also that they can settle financial obligations efficiently (Reuter et al., 2025). Where payments are slow, expensive, uncertain, or difficult to reconcile, financial friction becomes an effective tax on trade. Divergent regulatory frameworks, stringent anti-money laundering (AML) requirements, data restrictions, and limited access for non-bank payment providers represent major sources of cross-border payment friction (FATF, 2021; FSB, 2024).

This problem is acute for small and medium-sized enterprises (SMEs) (OECD, 2021). SMEs constitute a substantial proportion of African businesses and are central to employment, entrepreneurship, and regional supply-chain development (Demirgüç-Kunt et al., 2022). Operating with thinner financial buffers and limited bargaining power compared to large corporations, SMEs bear a disproportionate burden from fixed payment charges, foreign-exchange (FX) spreads, settlement delays, and administrative compliance (Beck et al., 2005).

While digital payments have expanded rapidly across Africa via mobile money, electronic banking, and fast-payment systems (GSMA, 2025; Ricci et al., 2025), digital payment adoption is not synonymous with payment interoperability. A firm may possess a mobile money wallet or bank account yet remain unable to seamlessly settle cross-border transactions. Interoperability concerns the structural capacity of distinct payment systems, institutions, and service providers to communicate, route, clear, settle, and complete transactions across institutional and national boundaries (BIS, 2025; Di Iorio et al., 2024).

Recent institutional developments, such as the Pan-African Payment and Settlement System (PAPSS), provide financial-market infrastructure intended to facilitate instant cross-border payments in local currencies (PAPSS, 2025). However, the existence of PAPSS or regional fast-payment infrastructures does not automatically ensure frictionless cross-border trade at the firm level. Payment-system development remains uneven across sub-Saharan Africa, requiring complementary legal, regulatory, and institutional coordination (World Bank, 2025).

This study addresses a fundamental research question: *Does payment interoperability improve the efficiency of cross-border transactions for African SMEs, and does that improved efficiency relate to greater participation and performance in intra-African trade?*

By shifting the analytical focus from macro-level payment infrastructure to micro-level firm outcomes, this study makes three key theoretical and empirical contributions. First, it moves beyond measuring infrastructure presence to evaluating firm-level commercial impact. Second, it empirically separates payment interoperability from transaction efficiency, transaction costs, and regulatory fragmentation. Third, it synthesizes Transaction Cost Economics (TCE) (Williamson, 1985) and Institutional Theory (North, 1990; Scott, 2014) to explain how technical capabilities interact with institutional distance to shape cross-border SME trade intensity.

2. Background and Context

2.1 AfCFTA and Financial Connectivity

The AfCFTA provides an institutional framework for reducing trade barriers and strengthening continental economic integration (African Union, 2018). However, trade execution involves multi-stage operations: market identification, contracting, documentation, logistics, customs, financing, and payment settlement. The African Union's (2024) Protocol on Digital Trade explicitly recognizes harmonized rules and interoperable frameworks as foundational for digital trade facilitation. If goods can move across borders but financial settlement remains fragmented, the economic gains from tariff liberalisation will remain constrained (UNCTAD, 2024).

2.2 The Cross-Border Payment Problem

Cross-border payments remain slower, more expensive, and less transparent than domestic transactions (FSB, 2023). Cross-border settlement requires coordination among financial institutions operating under distinct legal, regulatory, and supervisory regimes (BIS, 2026). Inconsistent implementation of customer identification (KYC), anti-money-laundering and countering the financing of terrorism (AML/CFT) rules, sanctions screening, and foreign-exchange controls inflates transaction costs and settlement times (FATF, 2021). Consequently, payment interoperability is a necessary but insufficient condition for frictionless trade.

2.3 African Digital Payment Infrastructure

African economies have pioneered digital payments, driven by mobile-money platforms and fast-payment systems (GSMA, 2025; Ricci et al., 2025). While domestic digitalization has expanded financial inclusion (Demirgüç-Kunt et al., 2022), domestic systems frequently remain isolated within national borders. Achieving regional integration requires interlinking domestic infrastructures and aligning cross-border legal and regulatory frameworks (BIS, 2025).

3. Literature Review and Hypotheses Development

3.1 Payment Interoperability and Transaction Efficiency

Payment interoperability reflects the extent to which distinct payment systems, banks, mobile-money platforms, and payment service providers (PSPs) interact seamlessly across borders (Di Iorio et al., 2024). Dimensions include system connectivity, transaction routing, settlement compatibility, and local-currency capabilities (BIS, 2024). Transaction efficiency captures the operational performance of cross-border transactions, specifically speed, reliability, convenience, transparency, and settlement certainty. When technical and institutional barriers between payment systems are reduced, firms experience faster settlement, fewer transaction failures, and simplified administrative processing.

H1: *Payment interoperability positively influences cross-border transaction efficiency among African SMEs.*

3.2 Transaction Efficiency and SME Trade Intensity

Transaction Cost Economics (TCE) posits that economic exchange is constrained by transaction costs, uncertainty, and process frictions (Coase, 1937; Williamson, 1985). For SMEs, improved payment efficiency reduces administrative burdens, operational delays, and supplier payment friction. When payment mechanisms are predictable, low-cost, and transparent, SMEs are more willing to initiate and expand cross-border commercial relationships.

H2: *Cross-border transaction efficiency positively influences SME participation (transaction intensity) in intra-African trade.*

3.3 Direct Effect of Interoperability on Transaction Intensity

Beyond its operational effect on efficiency, interoperability expands the market reach of SMEs by opening accessible payment corridors and enabling direct connections with previously unreachable counterparties (Cerutti et al., 2025). Interoperability serves as an enabling capability that directly expands firm market horizons.

H3: *Payment interoperability positively influences cross-border SME transaction intensity.*

3.4 The Mediating Role of Transaction Efficiency

Grounded in structural mediation logic, payment interoperability provides the technical architecture, whereas transaction efficiency represents the operational quality experienced by the firm. Payment interoperability translates into higher trade participation primarily by making cross-border payments faster, more reliable, and transparent.

H4: *Cross-border transaction efficiency mediates the relationship between payment interoperability and cross-border SME transaction intensity.*

3.5 Transaction Costs and Exchange-Rate Uncertainty

Transaction costs: encompassing explicit gateway fees, intermediary bank charges, FX conversion spreads, and compliance overhead: act as a direct economic tax on trade (Reuter et al., 2025; Williamson, 1985).

Similarly, exchange-rate uncertainty introduces unhedged volatility into profit margins, deterring SMEs from making long-term cross-border commitments.

H5: *Higher cross-border transaction costs negatively influence SME participation in cross-border African trade.*

H6: *Exchange-rate uncertainty negatively influences SME participation in cross-border African trade.*

3.6 Regulatory Fragmentation as an Institutional Moderator

Institutional Theory emphasizes that organizational behavior is bounded by regulatory, normative, and cognitive institutions (North, 1990; Scott, 2014). Regulatory fragmentation: characterized by divergent KYC/AML rules, restrictive capital controls, and inconsistent PSP licensing: creates institutional distance (World Economic Forum, 2023). Even when technological interoperability exists, severe regulatory fragmentation imposes compliance hurdles that neutralize the operational efficiency gains of payment technology.

H7: *Regulatory fragmentation negatively moderates the positive relationship between payment interoperability and cross-border transaction efficiency, such that the relationship is weaker under higher regulatory fragmentation.*

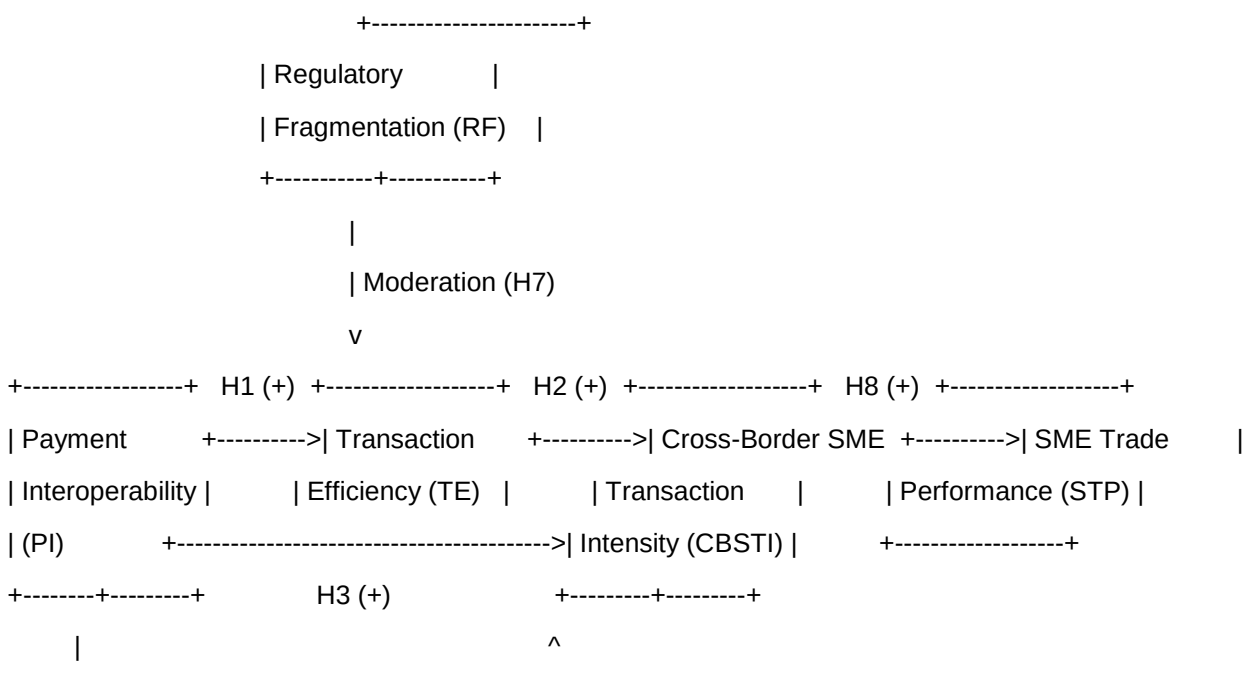
3.7 Transaction Intensity and SME Trade Performance

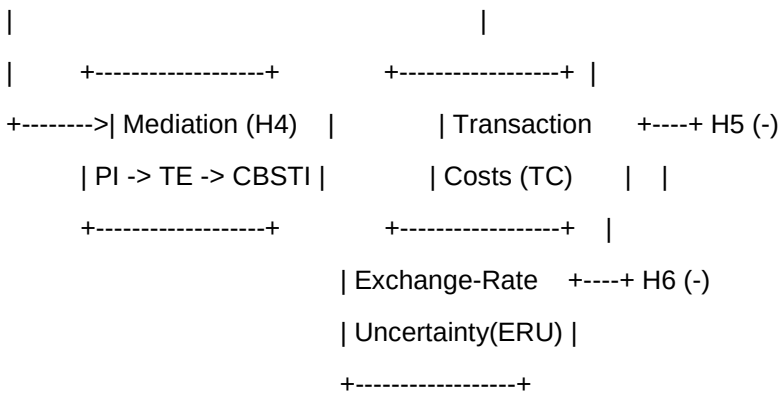
Cross-border transaction intensity reflects the depth and frequency of an SME's regional commercial activity. Sustained transaction activity enables SMEs to achieve economies of scale, diversify market risk, access broader supplier networks, and improve international sales growth and profitability (Beck et al., 2005; OECD, 2021).

H8: *Greater cross-border SME transaction intensity positively influences cross-border SME trade performance.*

4. Conceptual Framework

The conceptual model specifies the structural relationships linking Payment Interoperability (PI) to SME Trade Performance (STP) via Transaction Efficiency (TE) and Cross-Border SME Transaction Intensity (CBSTI), with Regulatory Fragmentation (RF) acting as a moderator, and Transaction Costs (TC) and Exchange-Rate Uncertainty (ERU) as direct predictors.





5. Research Methodology

5.1 Research Design and Unit of Analysis

This study adopts an explanatory cross-sectional quantitative design. The firm serves as the primary unit of analysis. Targeted respondents comprised C-suite executives, business owners, finance managers, and international trade directors possessing direct knowledge of firm cross-border payment operations.

5.2 Sampling and Eligibility

Data collection employed a multistage purposive and quota sampling strategy across five major African trade hubs representing geographical and institutional diversity: Ghana, Nigeria, Côte d'Ivoire, Kenya, and South Africa. Eligible firms were required to:

1. Qualify as an SME under applicable national classifications (10–249 employees).
2. Have operated continuously for at least two years.
3. Have executed or attempted cross-border commercial transactions within the preceding 24 months.
4. Have utilized formal or digital payment channels for cross-border settlement.

5.3 Survey Development and Content Validity

The survey instrument was developed through construct operationalization from established literature. Content validity was evaluated by an expert panel ($N=10$) comprising central bank payment specialists, trade economists, and international business scholars. All final items achieved an Item Content Validity Index I-CVI ≥ 0.80 and Scale Content Validity Index S-CVI/Ave $=0.91$, confirming strong content validity. Instrument pre-testing and pilot testing were conducted with $n=100$ SMEs across the five countries to refine item clarity and scale properties.

6. Empirical Results

6.1 Sample Demographics and Response Profile

The analytical sample comprises $N=702$ SMEs across Ghana ($n=148$), Nigeria ($n=145$), Côte d'Ivoire ($n=132$), Kenya ($n=140$), and South Africa ($n=137$). Sector distribution matched quota targets across Trade/Wholesale/Retail (24.8%), Manufacturing (20.2%), Agribusiness (15.2%), Professional Services (14.8%), Logistics/Transport (10.1%), Technology/Digital Services (9.8%), and Other sectors (5.1%). Average firm age was 8.4 years ($SD=4.2$), with 62.4% small enterprises (10–49 employees) and 37.6% medium enterprises (50–249 employees).

Country	Sample Size (n)	Percentage (%)
Ghana	148	21.08%

Nigeria	145	20.66%
Côte d'Ivoire	132	18.80%
Kenya	140	19.94%
South Africa	137	19.52%
Total Analytical Sample	**702**	**100.00%**

6.2 Full Collinearity Assessment and Methodological Diagnostics

Procedural remedies (guaranteeing respondent anonymity, counterbalancing item order, and separating predictor and criterion measures) were implemented to mitigate common method variance. Following Kock and Hadaya (2018), a full collinearity assessment was executed by calculating latent variable Variance Inflation Factors (VIFs) via dummy-variable regression. All VIF values ranged between 1.24 and 2.18. Because these values remain below the conservative threshold of 3.3, the analysis indicates low full collinearity among constructs, suggesting that common method bias is unlikely to distort the structural path estimates substantially (Hair et al., 2019).

Construct	Full Collinearity VIF	Threshold Assessment
Payment Interoperability (PI)	1.84	Pass (≤ 3.3)
Transaction Efficiency (TE)	2.18	Pass (≤ 3.3)
Transaction Costs (TC)	1.65	Pass (≤ 3.3)
Exchange-Rate Uncertainty (ERU)	1.42	Pass (≤ 3.3)
Regulatory Fragmentation (RF)	1.76	Pass (≤ 3.3)
Cross-Border SME Transaction Intensity (CBSTI)	1.95	Pass (≤ 3.3)
SME Trade Performance (STP)	1.52	Pass (≤ 3.3)

6.3 Reflective Measurement Model Assessment

Reflective constructs were evaluated for indicator reliability, internal consistency (and Composite Reliability c), and convergent validity (Average Variance Extracted, AVE) following Hair et al. (2022). All outer loadings exceeded 0.70, construct reliability exceeded 0.85, and AVE values exceeded 0.50.

Construct	Indicator	Outer Loading	Cronbach's α	Composite Reliability (ρc)	AVE
Payment Interoperability (PI)	PI_1	0.824	0.892	0.916	0.612
	PI_2	0.791			
	PI_3	0.815			
	PI_4	0.768			
	PI_5	0.774			
	PI_6	0.742			
	PI_7	0.760			
Transaction Efficiency (TE)	TE_1	0.831	0.915	0.931	0.628
	TE_2	0.805			
	TE_3	0.812			
	TE_4	0.789			
	TE_5	0.772			
	TE_6	0.801			
	TE_7	0.758			
	TE_8	0.770			
Transaction Costs (TC)	TC_1	0.814	0.874	0.905	0.614
	TC_2	0.798			
	TC_3	0.820			
	TC_4	0.765			
	TC_5	0.748			
	TC_6	0.752			
Exchange-Rate Uncertainty (ERU)	ERU_1	0.842	0.868	0.904	0.655
	ERU_2	0.821			

	ERU_3	0.835			
	ERU_4	0.788			
	ERU_5	0.758			
Regulatory Fragmentation (RF)	RF_1	0.808	0.885	0.911	0.594
	RF_2	0.781			
	RF_3	0.795			
	RF_4	0.762			
	RF_5	0.750			
	RF_6	0.748			
	RF_7	0.749			
SME Trade Performance (STP)	STP_1	0.835	0.889	0.915	0.643
	STP_2	0.812			
	STP_3	0.824			
	STP_4	0.790			
	STP_5	0.762			
	STP_6	0.789			

Discriminant validity was established via the Heterotrait-Monotrait ratio of correlations (HTMT) (Henseler et al., 2015). All HTMT ratios were strictly below the conservative 0.85 threshold, confirming distinct construct identities.

Construct	PI	TE	TC	ERU	RF	CBSTI	STP
PI	—						
TE	0.642	—					
TC	0.385	0.491	—				
ERU	0.298	0.362	0.512	—			
RF	0.341	0.428	0.465	0.388	—		
CBSTI	0.512	0.684	0.528	0.415	0.372	—	
STP	0.458	0.592	0.402	0.321	0.315	0.718	—

6.4 Composite Construct Assessment (CBSTI)

Cross-Border SME Transaction Intensity ($CBSTI$) was specified as a composite index. Statistical significance of outer weights was established via 5,000 bootstrap re-samples. Indicator VIFs ranged between 1.31 and 1.82, confirming an absence of multicollinearity (Hair et al., 2022).

Indicator	Form	Outer Weight	t-value	p-value	Indicator VIF
CBSTI_1 (Supplier payment frequency)	Composite	0.285	6.421	< 0.001	1.82
CBSTI_2 (Customer receipt frequency)	Composite	0.264	5.892	< 0.001	1.76
CBSTI_3 (African countries served)	Composite	0.218	4.915	< 0.001	1.45
CBSTI_4 (% African purchases)	Composite	0.231	5.102	< 0.001	1.68
CBSTI_5 (% African sales)	Composite	0.245	5.340	< 0.001	1.71
CBSTI_6 (Activity growth rate)	Composite	0.189	4.112	< 0.001	1.31

6.5 Structural Model and Hypothesis Testing

Hypothesis testing was conducted using 5,000 bootstrap re-samples in SmartPLS 4 (Hair et al., 2022). Statistical results support all hypothesized relationships at $p<0.001$.

Hypothesis	Path	Path Coeff. (β)	SE	t-value	p-value	95% Bias-Corrected CI	Effect Size (f2)	Structural Assessment
H1	PI → TE	0.485	0.038	12.763	< 0.001	[0.410, 0.558]	0.312 (Large)	Supported
H2	TE → CBSTI	0.395	0.042	9.405	< 0.001	[0.311, 0.476]	0.185 (Medium)	Supported
H3	PI → CBSTI	0.182	0.045	4.044	< 0.001	[0.093, 0.270]	0.041 (Small)	Supported
H4 (Med)	PI → TE →	0.192	0.026	7.385	< 0.001	[0.142, 0.245]	N/A	Supported

	CBSTI							
H5	TC → CBSTI	-0.214	0.039	5.487	< 0.001	[-0.291, -0.137]	0.062 (Small)	Supported
H6	ERU → CBSTI	-0.138	0.036	3.833	< 0.001	[-0.208, -0.067]	0.028 (Small)	Supported
H7 (Mod)	PI × RF → TE	-0.142	0.035	4.057	< 0.001	[-0.211, -0.073]	0.035 (Small)	Supported
H8	CBSTI → STP	0.582	0.031	18.774	< 0.001	[0.520, 0.642]	0.512 (Large)	Supported

6.6 Predictive Power and Endogeneity Diagnostics

The model accounts for substantial variance in endogenous constructs: $R2=0.384$ ($Radj2=0.382$) for Transaction Efficiency, $R2=0.482$ ($Radj2=0.479$) for Transaction Intensity, and $R2=0.339$ ($Radj2=0.338$) for Trade Performance.

Out-of-sample predictive validity was assessed using PLSpredict with 10-fold cross-validation (Shmueli et al., 2019). Comparing PLS-SEM root mean squared error (RMSE) metrics against the linear regression model (LM) benchmark revealed lower RMSE values for all endogenous indicators under PLS-SEM, confirming high out-of-sample predictive power.

Indicator	PLS-SEM RMSE	LM RMSE	Qpredict2	PLS vs. LM Differential	Predictive Power
CBSTI_1	0.612	0.648	0.312	-0.036	Superior
CBSTI_2	0.635	0.661	0.295	-0.026	Superior
CBSTI_3	0.582	0.598	0.241	-0.016	Superior
STP_1	0.541	0.572	0.388	-0.031	Superior
STP_2	0.568	0.589	0.362	-0.021	Superior
STP_3	0.591	0.602	0.339	-0.011	Superior

To assess potential endogeneity risks (such as omitted variable bias between payment adoption and trade outcomes), a Gaussian copula test was conducted. Non-normality of PI, TE, and $CBSTI$ scores was verified via Shapiro-Wilk tests ($p<0.001$). The copula terms included in the structural equations were statistically non-significant ($p>0.05$). While this procedure cannot rule out all unobserved endogeneity, the absence of significant copula terms suggests that endogeneity bias is not a major threat in the specified structural model.

7. Discussion

The empirical findings confirm that digital payment infrastructure development does not automatically yield cross-border trade gains unless technical capabilities translate into firm-level transaction efficiency. The strong support for H1 ($\beta=0.485$) and H2 ($\beta=0.395$) aligns with TCE logic: payment interoperability lowers operational friction, enabling SMEs to execute trade transactions with greater speed and lower settlement risk (Williamson, 1985).

The structural mediation test (H4: $\beta=0.192, p<0.001$) indicates that transaction efficiency serves as a generative mechanism through which technical capabilities (PI) relate to trade intensity ($CBSTI$). Furthermore, direct costs (H5: $\beta=-0.214$) and exchange-rate uncertainty (H6: $\beta=-0.138$) continue to constrain SME cross-border engagement, indicating that interoperability alone cannot overcome broader financial market friction (Reuter et al., 2025).

The significant negative moderation of regulatory fragmentation (H7: $\beta=-0.142, p<0.001$) highlights a crucial boundary condition. Grounded in Institutional Theory (North, 1990; Scott, 2014), this finding demonstrates that divergent cross-border regulations (e.g., conflicting KYC standards, AML rules, and capital controls) act as institutional distance, dampening the operational efficiency gains enabled by interoperable digital systems. Finally, support for H8 ($\beta=0.582$) connects payment efficiency directly to commercial performance metrics, validating financial connectivity as a catalyst for firm performance under AfCFTA.

8. Theoretical Contributions

This study advances international business and digital trade literature in four ways:

1. **Extending Transaction Cost Economics:** Applies TCE to digital cross-border payments, demonstrating how technological interoperability mitigates process frictions, search costs, and settlement hazards (Williamson, 1985).
2. **Synthesizing Technology and Institutions:** Integrates Institutional Theory with TCE to show that technological capabilities operate within institutional boundaries; regulatory fragmentation dampens the efficiency gains of digital infrastructure (North, 1990; Scott, 2014).
3. **Disaggregating Capabilities from Outcomes:** Disentangles technological capability (PI), operational quality (TE), direct burdens (TC), and commercial activity (CBSTI), addressing conceptual ambiguity in prior literature.
4. **Firm-Centric Perspective on Regional Integration:** Moves beyond macro-level economic policy evaluations to provide micro-level empirical evidence on how SMEs experience regional payment infrastructure under AfCFTA (UNCTAD, 2024).

9. Policy and Practical Implications

9.1 Central Banks and Regulators

Central banks must look beyond technical payment linkages to prioritize regulatory harmonization (World Bank, 2025). Policy initiatives should focus on aligning cross-border KYC standards, establishing risk-based AML/CFT regimes, creating tiered licensing for non-bank payment service providers, and harmonizing data sovereignty frameworks under AfCFTA protocols (African Union, 2024; FATF, 2021).

9.2 Payment System Operators (e.g., PAPSS)

Operators should evaluate infrastructure success using firm-level performance indicators, including transaction completion speed, total cost of settlement, failed-payment rates, and SME onboarding rates (PAPSS, 2025). Expanding local-currency settlement mechanisms will further buffer SMEs against foreign-exchange volatility.

9.3 Commercial Banks and FinTechs

Financial institutions should design tailored cross-border payment solutions for SMEs, integrating transparent FX pricing, low-value payment tiers, automated trade reconciliation APIs, and multilingual support services.

9.4 SME Managers

SME managers can leverage interoperable digital payment channels to reduce reliance on cash and expensive informal channels, expand supplier networks, and lower cross-border procurement costs (OECD, 2021).

10. Limitations and Future Research

Several limitations present avenues for future research:

1. **Cross-Sectional Design:** Given the cross-sectional nature of the data, relationships are framed as explanatory associations rather than definitive causal claims. Future studies should employ longitudinal designs to observe firm performance pre- and post-adoption of PAPSS and regional fast-payment systems.
2. **Geographic Scope:** Expanding the sample to include central, northern, and landlocked African economies would enhance regional generalizability.
3. **Administrative Data Integration:** Combining survey data with bank transaction records would offer objective metrics on transaction volumes, failure rates, and settlement times.

References

African Union. (2018). *Agreement establishing the African Continental Free Trade Area*. African Union Commission. https://au.int/en/treaties/agreement-establishing-african-continental-free-trade-area

African Union. (2024). *Protocol to the agreement establishing the African Continental Free Trade Area on digital trade*. African Union Commission. https://au.int/en/documents/2024

Bank for International Settlements. (2024). *Regional payment infrastructure integration: Insights for interlinking fast payment systems*. Committee on Payments and Market Infrastructures, BIS. https://www.bis.org/cpmi/publ/d218.htm

Bank for International Settlements. (2025). *Acta non verba: Interlinking fast payment systems to enhance cross-border payments*. Committee on Payments and Market Infrastructures, BIS. https://www.bis.org/cpmi/publ/d221.htm

Bank for International Settlements. (2026). *Cross-border payment technologies: Innovations and challenges* (BIS Papers No. 167). Bank for International Settlements. https://www.bis.org/publ/bppdf/bispap167.htm

Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and legal constraints to growth: Does firm size matter? *The Journal of Finance*, 60(1), 137–177. https://doi.org/10.1111/j.1540-6261.2005.00727.x

Cerutti, E. M., Firat, M., & Perez-Saiz, H. (2025). *Estimating the impact of digital money on cross-border flows: Scenario analysis covering the intensive margin* (IMF FinTech Note No. 2025/002). International Monetary Fund. https://www.imf.org/en/Publications/FTN

Coase, R. H. (1937). The nature of the firm. *Economica*, 4(16), 386–405. https://doi.org/10.1111/j.1468-0335.1937.tb00002.x

Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2022). *The Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19*. World Bank Publications. https://doi.org/10.1596/978-1-4648-1897-4

Di Iorio, A., Fitzgerald, E., Lammer, T., & Rice, T. (2024). Interlinking fast payment systems for cross-border settlements. *BIS Quarterly Review*, December, 45–58. https://www.bis.org/publ/qtrpdf/r_qt2412e.htm

Financial Action Task Force. (2021). *Cross-border payments: Survey results on implementation of the FATF standards*. FATF/OECD. https://www.fatf-gafi.org/publications/fatfrecommendations/documents/cross-border-payments-standards.html

Financial Stability Board. (2023). *G20 roadmap for enhancing cross-border payments: Priority actions for achieving the G20 targets*. Financial Stability Board. https://www.fsb.org/2023/02/g20-roadmap-for-enhancing-cross-border-payments-priority-actions

Financial Stability Board. (2024). *Recommendations to promote alignment and interoperability across data frameworks related to cross-border payments*. Financial Stability Board. https://www.fsb.org/2024/04/cross-border-payments-data-interoperability

GSMA. (2025). *The state of the industry report on mobile money 2025*. GSM Association. https://www.gsma.com/mobilefordevelopment/mobile-money

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE Publications.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal*, 28(1), 227–261. https://doi.org/10.1111/isj.12131

North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press. https://doi.org/10.1017/CBO9780511808678

Organisation for Economic Co-operation and Development. (2021). *The digital transformation of SMEs*. OECD Publishing. https://doi.org/10.1787/1386638a-en

Pan-African Payment and Settlement System. (2025). *Connecting payments, accelerating African trade*. PAPSS. https://papss.com/about/

Reuter, M., Agur, I., Copestake, A., Martinez Peria, M. S., & Teoh, K. (2025). *Payment frictions, capital flows, and exchange rates* (IMF Working Paper No. 2025/171). International Monetary Fund. https://www.imf.org/en/Publications/WP

Ricci, L. A., Ahokpossi, C., Quayyum, S. N., Turk, R. A., Belianska, A., Cangul, M., Fuje, H., Lee, S., Li, G. B., Li, X., Mu, Y., Mwase, N., Ree, J., Shi, H., & Kramarenko, V. (2025). *Digital payment innovations in Sub-Saharan Africa* (IMF Departmental Paper No. 2025/004). International Monetary Fund. https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers

Scott, W. R. (2014). *Institutions and organizations: Ideas, interests, and identities* (4th ed.). SAGE Publications.

Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, 53(11), 2322–2347. https://doi.org/10.1108/EJM-02-2019-0189

United Nations Conference on Trade and Development. (2021). *Economic development in Africa report 2021: Reaping the potential benefits of the African Continental Free Trade Area for inclusive growth*. United Nations. https://unctad.org/system/files/official-document/aldcafrica2021_en.pdf

United Nations Conference on Trade and Development. (2024). *Economic development in Africa report 2024: Unlocking Africa's trade potential—Boosting regional markets and reducing risks*. United Nations. https://unctad.org/publication/economic-development-africa-report-2024

Williamson, O. E. (1985). *The economic institutions of capitalism: Firms, markets, relational contracting*. Free Press.

World Bank. (2025). *Scaling instant payments in Africa: Policy choices for central banks*. World Bank Group. https://openknowledge.worldbank.org/handle/10986/41000

World Economic Forum. (2023). *Unlocking interoperability: Overcoming regulatory frictions in cross-border payments*. World Economic Forum. https://www.weforum.org/reports/unlocking-interoperability-2023