

Prospects for cross-border e-payments in the East African Community (EAC): What barriers limit access and interoperability?

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Abstract

This study examines the drivers of access and interoperability challenges in cross-border digital payments within the East African Community (EAC) using World Bank Enterprise Survey data from Kenya, Rwanda, Tanzania and Uganda. By applying the Heckman selection approach, the study analyses enterprise decisions to adopt and use e-payments options in executing transactions. The findings show that internet connectivity, transaction costs and country-specific digital infrastructure significantly shape e-payment adoption. Kenya emerges as the region's digital payments leader, driven by mobile money and fintech integration, while Tanzania exhibits significant fragmentation, high transaction costs and weak interoperability. Uganda and Rwanda display mixed adoption patterns. On account of the foregoing, the study makes three key recommendations. First, is the harmonization of regional payment regulations particularly on customer onboarding, anti-money laundering and combating of financing of terrorism, licensing and data governance to reduce regulatory duplication, to lower compliance costs and facilitate seamless cross-border operations for payment service providers. Second, is investment in Shared e-Payment Infrastructure through a number of avenues including accelerating the adoption of common technical standards, strengthen regional payment switches and real-time settlement systems, and third, is promoting inclusive and competitive interoperability by rolling out policies and measures that require dominant or near-dominant payment providers and mobile money operators to support open-access interoperability frameworks.

1.0 Introduction

E-payments have become a critical component of the modern digital economy, enabling individuals, businesses and governments to conduct financial transactions efficiently both within countries and across borders. Advances in financial technology, mobile connectivity and digital platforms have transformed the global payments landscape, allowing financial institutions and payment service providers to facilitate faster, safer and more efficient transactions. These developments have been particularly significant for emerging economies, where digital payment systems have expanded financial inclusion and supported economic activity (World Bank, 2023; BIS, 2021).

A growing body of literature attributes this transformation to the broader digitalization of financial services. Digital technologies significantly reduce transaction costs for financial service providers, increase returns to scale and enable the delivery of services at lower margins, thereby making smaller-value financial transactions and loans commercially viable (Njuguna, 2017; Okot & Kasekende, 2024). As a result, financial institutions are increasingly able to extend services to previously underserved populations, particularly micro, small and medium enterprises (MSMEs), which constitute the backbone of most developing economies.

Within Africa, the East African Community (EAC) represents one of the most dynamic regions in terms of digital financial services (DFS) adoption. The EAC has experienced rapid growth in mobile money services and digital payment platforms over the past decade. Mobile money innovations, particularly the launch of M-Pesa in Kenya, have played a pivotal role in catalysing the region's digital finance revolution (Njuguna, 2017;

GSMA, 2023). Empirical evidence across the region consistently demonstrates that mobile money systems have significantly expanded access to financial services by enabling individuals and businesses to conduct electronic transactions at relatively lower cost (Wamalwa et al., 2024; Osoro et al., 2024; Okot & Kasekende, 2024).

Indeed, abundant literature identifies mobile money-based financial services as the foundation of East Africa's digital finance transformation. Studies from across the region, including Kenya, Tanzania, Uganda, Burundi and Rwanda, highlight how mobile payment ecosystems have enabled the rapid expansion of financial services, including savings, credit, remittances and merchant payments (Njuguna, 2017; Macha & Massawe, 2023; Bizoza & Irakoze, 2024; Ndoricimpa et al., 2024; Mwighusa & Diyamett, 2024). These innovations have also facilitated stronger linkages between mobile network operators, banks and fintech firms, creating an increasingly interconnected digital financial ecosystem.

Beyond financial inclusion, the expansion of digital payments has important implications for regional trade and economic integration. Efficient payment systems reduce transaction costs, improve liquidity management and enable firms to transact seamlessly across borders. These benefits are particularly important for MSMEs, which increasingly rely on digital platforms to participate in regional and international markets (EAC Secretariat, 2022; World Bank, 2023).

However, while the adoption of digital financial services has accelerated across the region, interoperability across payment systems remains uneven. Interoperability, that enables customers to transact seamlessly across different service providers, plays a critical role in enhancing the efficiency and inclusiveness of digital financial systems. By enabling end-to-end transactions between different financial service providers, interoperable systems expand customer choice, increase competition and reduce transaction costs (Cracknell et al., 2023). Evidence suggests that interoperability also simplifies the operational models of agents and payment service providers by reducing liquidity management challenges and improving the reach of digital financial services (Armél et al., 2024).

Within the EAC, the member states have different payment standards, governance structures and financial sector regulations. Although several regional initiatives have been introduced to enhance payment integration, including the East African Payment System (EAPS) and the Pan-African Payment and Settlement System (PAPSS), significant interoperability gaps remain (EAC Secretariat, 2021; Afreximbank, 2023). The evolution of interoperability in the region has followed a gradual trajectory, moving from bilateral arrangements between service providers to peer-to-peer scheme interoperability and, more recently, to attempts at establishing national switching platforms (Cracknell et al., 2023).

Moreover, the path toward full interoperability has been slow. Structural constraints, such as fragmented ownership structures, sustenance of legacy technological platforms, limited investment capacity and regulatory complexities, continue to hinder progress (Cracknell et al., 2023). In some cases, dominant market players may have limited incentives to open their platforms due to concerns about losing market power or competitive advantage. For example, the near dominance of Safaricom's M-Pesa ecosystem in Kenya has enabled extensive platform-level interoperability but has also raised concerns regarding market concentration and potential barriers to competition (Njuguna, 2021).

Overall, these developments present both challenges and opportunities for the banking sector within the EAC. Commercial banks remain significant players in cross-border payments through correspondent banking relationships, foreign exchange intermediation and settlement services. At the same time, the rapid expansion of fintech innovations and mobile money platforms is reshaping the competitive landscape of payment services. As digital commerce expands across the region, banks have an opportunity to leverage

interoperable payment infrastructures to enhance cross-border transaction efficiency, expand services to MSMEs and strengthen their role in regional financial integration.

Despite the growing importance of cross-border e-payments, empirical research examining the drivers of interoperability and access within the EAC remains limited. Much of the existing literature focus on mobile money adoption and financial inclusion. Against this backdrop, this study seeks to examine the drivers of access and interoperability challenges in cross-border digital payments within the East African Community.

The remainder of this paper is organized as follows. Section 2 reviews the relevant theoretical and empirical literature, while section 3 outlines the study's methodological framework. Section 4 presents the findings and discussion, and section 5 provides the summary, conclusions and policy recommendations.

2.0 Review of Literature

This section reviews the theoretical and empirical literature underpinning cross-border digital payment interoperability within the EAC.

From a theoretical perspective, the Network Externalities Theory posits that the value and utility of a network increase as more users join and actively participate within it (Katz & Shapiro, 1985). Payment systems therefore exhibit strong positive network effects, whereby wider adoption enhances convenience, efficiency, liquidity and overall usability. This helps explain the rapid expansion of mobile money ecosystems across East Africa, particularly the widespread adoption of mobile-based payment platforms that have significantly improved transaction convenience, accessibility and financial inclusion. As more users, merchants, banks and fintech firms participate in digital payment ecosystems, the functionality and attractiveness of such platforms increase exponentially, thereby reinforcing adoption and strengthening financial interconnectivity.

Complementing this perspective is the Transaction Cost Theory, that emphasizes the role of institutional arrangements and governance structures in shaping the cost of conducting economic transactions (Coase, 1937; Williamson, 1985). Here, payment systems are argued to significantly alter transaction costs associated with transferring value between economic agents by minimizing information asymmetries, delays, uncertainty and operational inefficiencies. Efficient cross-border payment infrastructures can therefore stimulate trade and regional integration by lowering settlement costs, reducing exchange frictions and enhancing transaction predictability.

Based on the foundational Financial Intermediation Theory, the evolution of digital technology in banking has affected how banks intermediate mobilized savings, manage liquidity risks, reduce information asymmetry and provide payment and settlement services. Banks continue to leverage technological innovation, interoperable payment infrastructure and fintech partnerships to expand cross-border financial services and improve MSMEs' access to regional and international markets.

From an empirical standpoint, international evidence consistently shows that cross-border payments remain significantly less efficient than domestic transactions. The Bank for International Settlements demonstrates that cross-border payments often involve multiple intermediaries, fragmented settlement processes and varying compliance requirements, resulting in higher transaction costs, delayed settlement and reduced pricing transparency (BIS, 2021). These inefficiencies largely stem from dependence on correspondent banking networks, fragmented regulatory frameworks and limited interoperability between national payment infrastructures. Consequently, businesses, particularly MSMEs, often face significant operational and financial barriers when conducting cross-border transactions.

In Africa, digital financial services have expanded rapidly, largely driven by the growth of mobile money ecosystems. Studies by the International Monetary Fund and the World Bank show that mobile money platforms have substantially improved financial inclusion across East Africa by enabling households and small businesses to undertake payments, savings, remittances and transfers using mobile devices (IMF, 2022; World Bank, 2023). East Africa, particularly Kenya, has emerged as a global leader in mobile money innovation following the success of Safaricom's M-Pesa platform. However, despite high levels of domestic digital payment penetration, interoperability across national payment systems and cross-border platforms remains relatively weak, thereby limiting the full integration potential of regional digital finance ecosystems.

Existing literature points to interoperability as a critical determinant of payment efficiency and financial integration. According to the World Bank (2022), interoperable payment systems significantly reduce transaction costs, improve settlement speed and enhance competition among payment service providers. In contrast, fragmented payment ecosystems constrain the scalability and efficiency of digital financial services. Similarly, studies by the East African Community Secretariat emphasize that harmonization of payment standards, regulatory frameworks and settlement systems is essential for achieving effective regional payment integration and supporting intra-regional trade (EAC Secretariat, 2022).

Country-specific evidence across the EAC further reveals substantial heterogeneity in the drivers and constraints shaping digital financial services adoption. In Kenya, factors such as competition within the banking and telecommunications sectors, mobile phone ownership, financial literacy and education levels significantly influence the adoption and utilization of digital financial services (Lwaka & Muriithi, 2024; Wamalwa et al., 2024). Studies also indicate that behavioural biases and socio-cultural factors contribute to persistent gender disparities in mobile money usage (Osoro et al., 2024). In Uganda, digital financial inclusion is largely driven by mobile phone penetration, fintech innovation and supportive regulatory frameworks, although network connectivity challenges and gender inequalities remain important constraints (Okot & Kasekende, 2024).

Similarly, studies from Burundi show that mobile money adoption is strongly influenced by socio-economic conditions, education levels and social network effects (Ndoricimpa et al., 2024; Bizoza & Irakoze, 2024). In Rwanda, strong government support for a cashless economy has accelerated the development of integrated digital payment infrastructure, although digital literacy gaps, infrastructure deficiencies and interoperability challenges persist (Ggombe, 2024). Meanwhile, in Tanzania, barriers related to smartphone penetration, taxation policies, coordination failures among fintech stakeholders and uneven digital infrastructure continue to hinder the growth of digital financial services despite recent technological improvements (Macha & Massawe, 2023; Mwigusa & Diyamett, 2024).

3.0 Methodology

3.1 Data description and overview of MSMEs Characteristics

The study utilized the latest country specific World Bank Enterprise Survey (WBES) enterprise-level data drawn from Micro, Small and Medium Enterprises (MSMEs) operating across four East African Community (EAC) countries namely Rwanda, Kenya, Tanzania and Uganda. The WBES contains standardized information on enterprise operations, financial access, digital payment usage, infrastructure reliability, trade participation and business environment constraints. Hence, it offers a robust platform for evaluating enterprise experiences with digital payments, cross-border transactions, infrastructure reliability, regulatory obstacles and financial access constraints.

Descriptive analysis is presented at the onset to characterize the enterprises utilization of e-payment options and consequently evaluate what drives access and interoperability. Across the East Africa member states, the MSME landscape is dominated by small and medium-sized enterprises. Small firms account for nearly

half of all establishments in Kenya (48.7%), Rwanda (47.9%) and Tanzania (54.4%), while Uganda exhibits a more balanced structure, with medium-sized firms constituting the largest share at 39.8% (**Figure 1**). The ownership structure also reveals a strong prevalence of informal or closely held business models (**Figure 2**). Sole proprietorships dominate in Rwanda (64.0%), Tanzania (70.8%) and Uganda (56.5%), whereas Kenya presents a more diversified corporate ecosystem, with sole proprietorships (37.7%) and limited partnerships (37.9%) almost equally represented. Publicly traded firms remain extremely rare across all the EAC countries, accounting for less than 4% of establishments. This trend is not a surprise since the EAC region has limited penetration of formal capital markets among MSMEs.

Figure 1: Distribution of MSMEs by Country and Firm Size

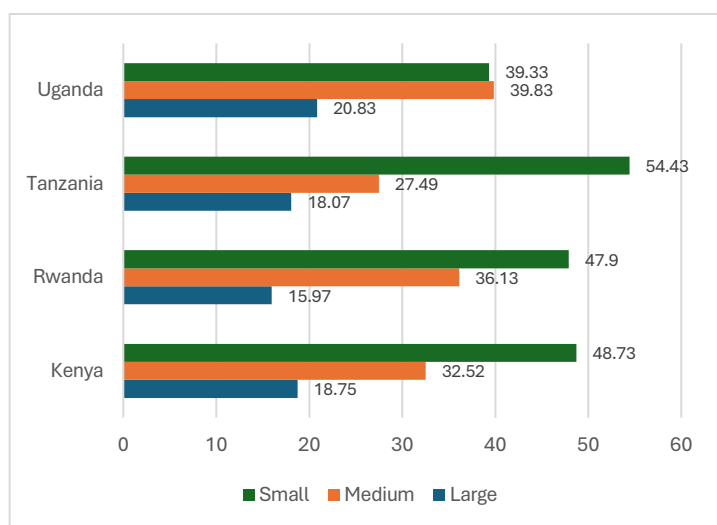
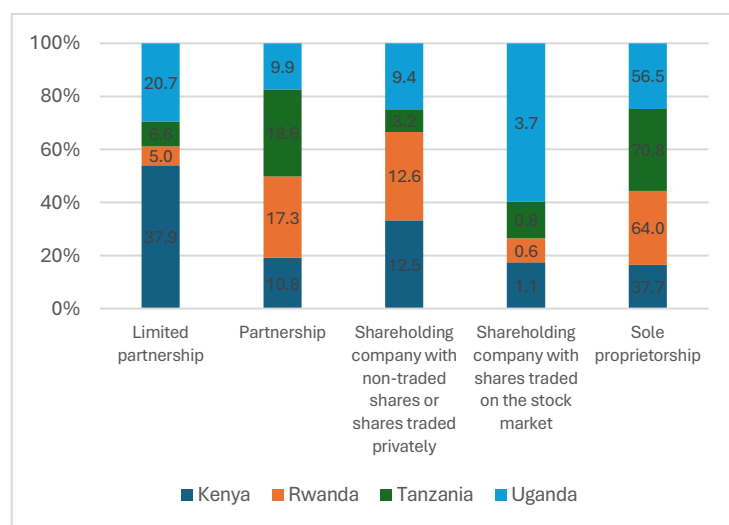


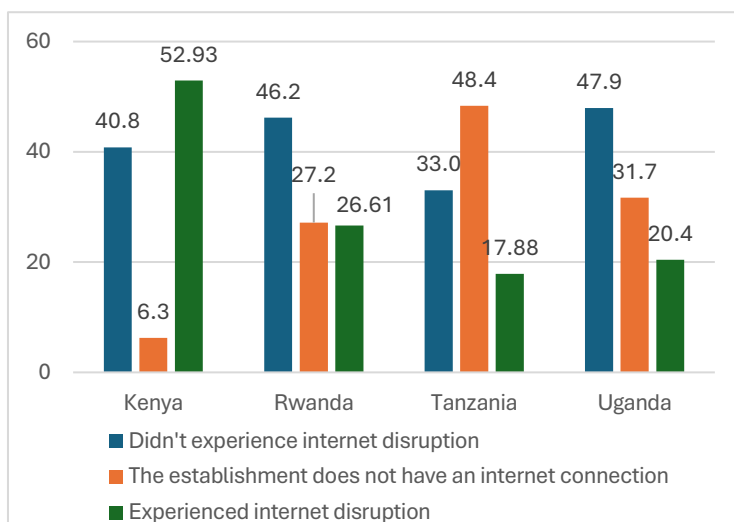
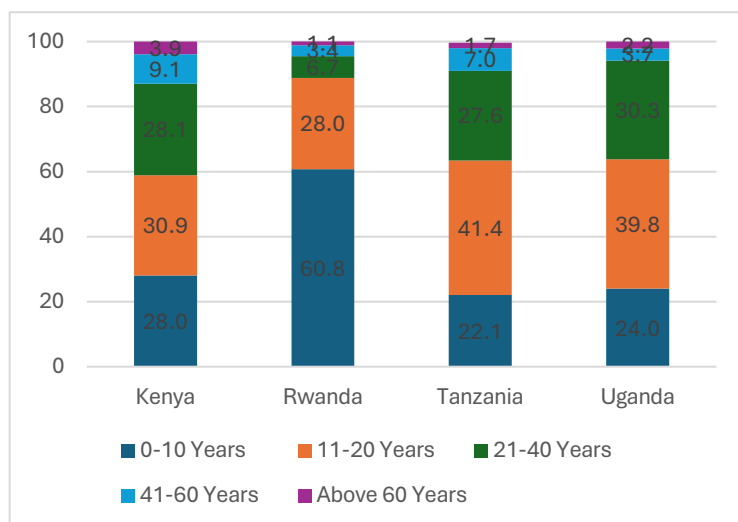
Figure 2: Legal Status of Enterprises Across Countries



The age distribution of enterprises further shows differing stages of business maturity across the region. Rwanda has the youngest business ecosystem, with 60.8% of firms operating for less than 10 years. In contrast, Kenya, Tanzania and Uganda display more mature enterprise structures, with a substantial concentration of firms in the 11 - 20 year and 21 - 40 year categories. Uganda stands out with 30.3% of firms operating for between 21 and 40 years (**Figure 3**). More than half of Kenyan firms (52.9%) reported experiencing internet disruptions within the previous year, compared to only 17.9% in Tanzania and 20.4% in Uganda. Tanzania also records the highest proportion of establishments without internet connectivity altogether (48.4%) (**Figure 4**). This trend is attributable to infrastructural constraints that could hinder digital financial adoption despite broader regional digitization efforts.

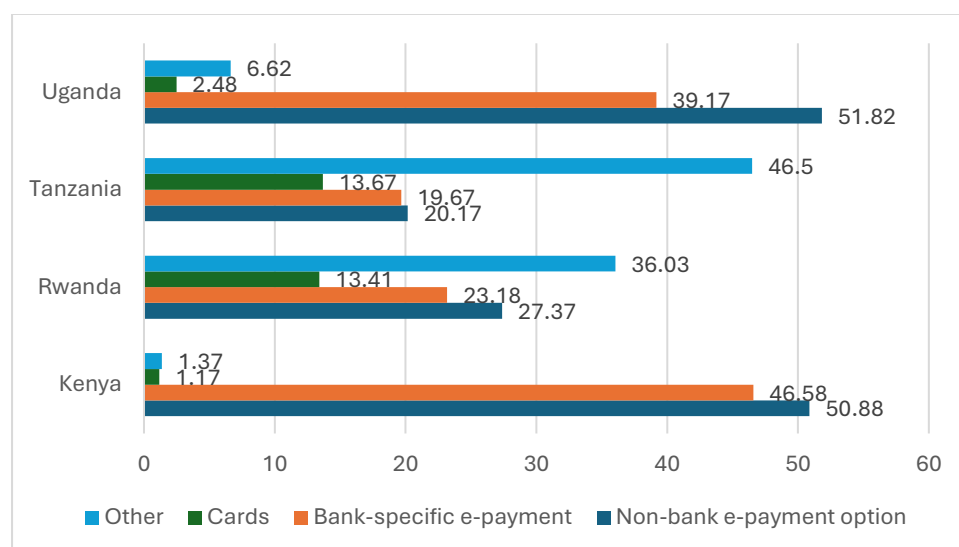
Figure 3: Period of operation of Enterprises Across Countries

Figure 4: Internet connection of Enterprises Across Countries



The data further reveals cross-country differences in the structure and maturity of digital payment ecosystems across the EAC (**Figure 5**). Kenya stands out as the region's digital payments powerhouse, with majority of the firms relying on non-bank e-payment options such as mobile money and e-wallets (50.88%) alongside bank-specific digital payment channels (46.58%). The near absence of card usage (1.17%) underscores the dominance of mobile first financial infrastructure and reflects Kenya's deeply entrenched fintech ecosystem. On the other hand, Uganda exhibits a remarkably similar pattern, with non-bank digital payment options accounting for 51.82% of usage and bank-specific e-payments contributing 39.17%. In contrast, Tanzania has a far more fragmented payment landscape. Nearly half of firms (46.50%) fall under "other" payment methods, while bank-specific e-payments (19.67%) and non-bank alternatives (20.17%) remain comparatively low. This dispersion points a potentially weaker digital integration and interoperability challenges within the formal payment ecosystem. Rwanda, on its part, presents a transitional structure characterized by relatively balanced adoption across cards (13.41%), non-bank e-payments (27.37%) and bank-specific platforms (23.18%). Nonetheless, the large "other" category (36.03%) is an indication that many firms still rely on informal or hybrid payment arrangements.

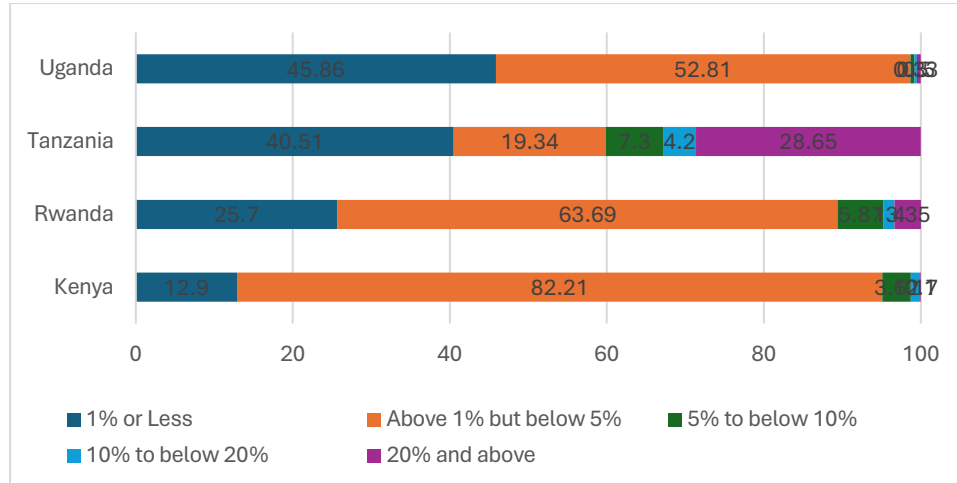
Figure 5: Preferred E-Payment Channels by Country



In terms of the transaction cost dynamics (**Figure 6**), Kenyan firms report the lowest effective transaction cost burden, with an overwhelming 82.21% of firms incurring costs of between above 0% and below 5%, while only 0.10% face costs exceeding 20%. Rwanda follows a similar trajectory, with 63.69% of firms

operating within the low-cost bracket, although a modest 3.35% still experience transaction costs above 20%, hence pointing to pockets of inefficiency within cross-border and formal banking channels. Tanzania, on its part, emerges as the clear outlier and cost hotspot within the EAC digital payments landscape. A staggering 28.65% of Tanzanian firms report transaction costs exceeding 20%, far above the levels observed in Kenya, Rwanda and Uganda. On the other hand, Uganda presents a mixed but relatively low-cost structure, with 52.81% of firms facing transaction costs below 5%. Moreover, 45.86% still report zero e-payment usage, suggesting continued dependence on cash-based or informal transaction mechanisms.

Figure 6: Average Transaction Costs by Payment Type and Country



3.2 Econometric model and variable Description

The analytical strategy proceeds in two stages. At the onset, descriptive statistics and cross-tabulations are used to profile the prevalence of digital payment adoption, interoperability challenges and payment barriers across EAC countries and firm categories. Then estimation of econometric models was undertaken. At this stage, three choice models were estimated. The first model, which examines the likelihood of the enterprises using e-payments versus not using them, is specified as follows:

$$P(Y = 1/X_1, X_2, \dots, X_n) = \phi(Z) \quad (1)$$

Where $\phi(Z) = \phi(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n)$, P is the outcome of the decision to either using e-payments or not for the Kth observation, ϕ is the standard cumulative normal, X_k is the vector of explanatory variables for observations k and β .

The second level of the analysis entailed modelling the dichotomy of using card verses non-card e-payment option by the enterprises and is specified as shown in equation 2:

$$P(Y = 1/X_1, X_2, \dots, X_n) = \pi(T) \quad (2)$$

Where $\pi(T) = \pi(\gamma_0 + \gamma_1 X_1 + \gamma_2 X_2 + \dots + \gamma_n X_n)$, P is the outcome of the decision to either using card or non-card e-payments for the Kth observation, π is the standard cumulative normal, X_k is the vector of explanatory variables for observations k and γ .

Lastly, equation 3 models the utilization of e-payments along the dimensions of bank vis a vis other (non-bank e-payment options, such as e-money, e-wallet and mobile money).

$$P(Y = 1/X_1, X_2, \dots, X_{10}) = \lambda(W) \quad (3)$$

Where $\lambda(W) = \lambda(\delta_0 + \delta_1 X_1 + \delta_2 X_2 + \dots + \delta_n X_n)$, P is the outcome of the decision to either using card or non-card e-payments for the Kth observation, λ is the standard cumulative normal, X_k is the vector of

explanatory variables for observations k and δ . Table 1 presents the operationalization of study variables as used in Equation 1, 2 and 3.

Table1: Operationalization of variables

Variable	Operational definition
Firm Size	
Small	Binary variable: 1 if small, 0 otherwise.
Medium	Binary variable: 1 if medium, 0 otherwise.
Large	Binary variable: 1 if large, 0 otherwise.
Legal Status	
Sole proprietorship	Binary variable: 1 if Sole proprietorship, 0 otherwise.
Partnership	Binary variable: 1 if Partnership, 0 otherwise.
Limited partnership	Binary variable: 1 if Limited partnership, 0 otherwise.
Shareholding company with non-traded shares or shares traded privately	Binary variable: 1 if Shareholding company with non-traded shares or shares traded privately, 0 otherwise.
Shareholding company with shares traded on the stock market	Binary variable: 1 if Shareholding company with shares traded on the stock market, 0 otherwise.
Years in Business	
0-10 Years	Binary variable: 1 if 0-10 Years, 0 otherwise.
11-20 Years	Binary variable: 1 if 11-20 Years, 0 otherwise.
21-40 Years	Binary variable: 1 if 21-40 Years, 0 otherwise.
41-60 Years	Binary variable: 1 if 41-60 Years, 0 otherwise.
Above 60 Years	Binary variable: 1 if Above 60 Years, 0 otherwise.
International Certification	Binary variable: 1 if it has International Certification, 0 otherwise.
Internet Disruption Experience	
Yes	Binary variable: 1 if Yes, 0 otherwise.
No	Binary variable: 1 if No, 0 otherwise.
The establishment does not have an internet connection	Binary variable: 1 if The establishment does not have an internet connection, 0 otherwise.
Average Cost per Transaction	
1% or less	Binary variable: 1 if 1% or less, 0 otherwise.
Above 1% but below 5%	Binary variable: 1 if Above 1% but below 5%, 0 otherwise.
5% to below 10%	Binary variable: 1 if 5% to below 10%, 0 otherwise.
10% to below 20%	Binary variable: 1 if 10% to below 20%, 0 otherwise.
Country	
Kenya	Binary variable: 1 if Kenya, 0 otherwise.

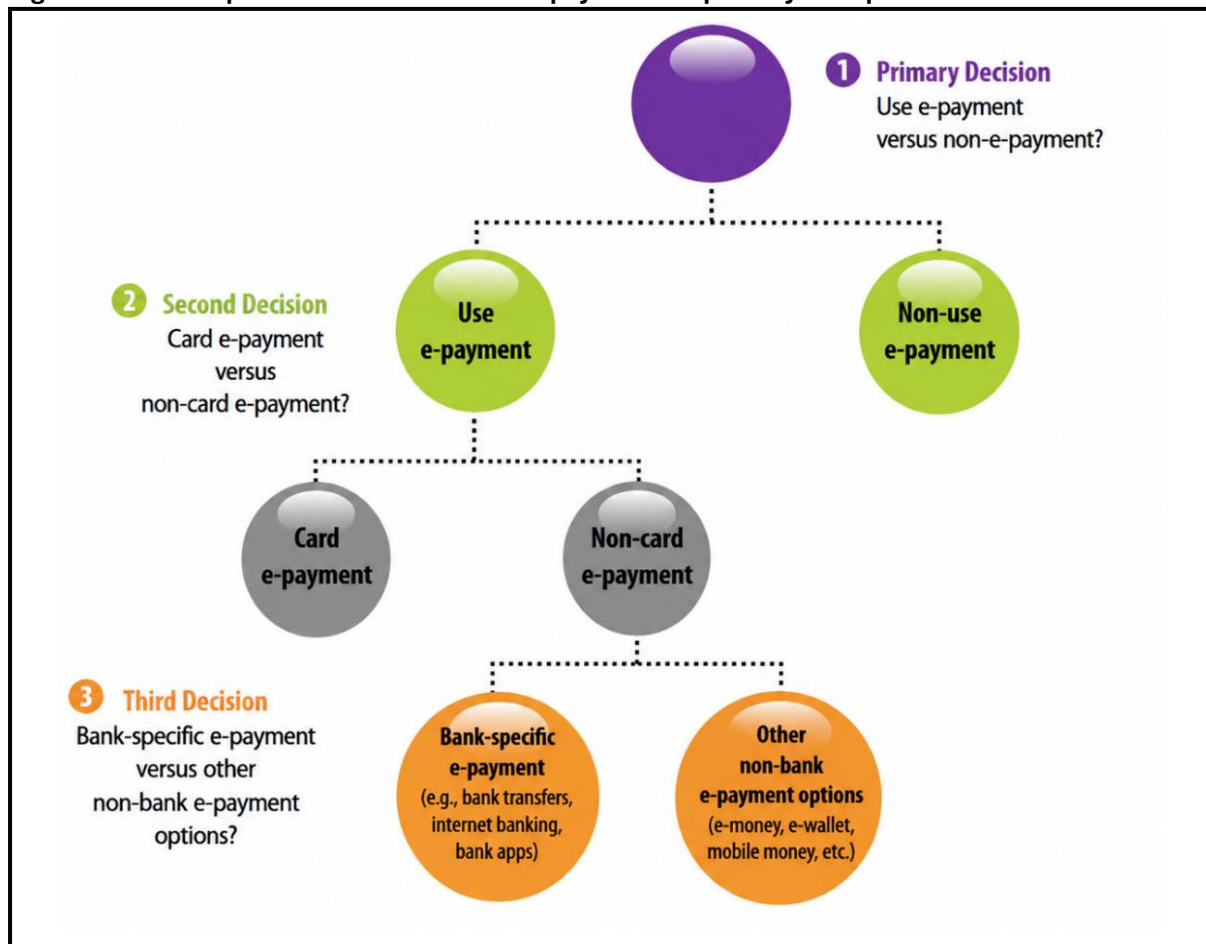
Variable	Operational definition
Rwanda	Binary variable: 1 if Rwanda, 0 otherwise.
Tanzania	Binary variable: 1 if Tanzania, 0 otherwise.
Uganda	Binary variable: 1 if Uganda, 0 otherwise.

3.2 Estimation Strategy

Discrete binary choice models can be estimated using several alternative approaches, including the Linear Probability Model (LPM), Binary Probit Model and Binary Logit Model, with the choice of estimation technique largely reflecting the trade-off between model flexibility and ease of estimation (Munizaga & Alvarez-Daziano, 2001).

Given the objective of modelling enterprise owners' decision-making behaviour regarding the adoption and use of cross-border e-payments (**Figure 7**), several discrete choice modelling approaches were considered. Among these, the nested logit model is commonly applied where decision alternatives can be grouped into related categories or "nests," thereby creating a hierarchical decision structure (Ben-Akiva & Lerman, 1985; Train, 2003). In such models, alternatives within the same nest are assumed to share correlated error terms, while alternatives across different nests remain uncorrelated. Unlike the standard logit model, the nested logit framework relaxes the restrictive assumption of independently and identically distributed error terms by allowing correlations among similar alternatives. Consequently, the model captures the possibility that certain alternatives may share common unobservable characteristics influencing the decision-making process (Hensher et al., 2005). However, nested logit models primarily account for similarities in unobserved utility components rather than explicitly modelling the sequential process of decision formation.

Figure 7: Decision process for cross-Border e-payment adaption by enterprises



Source: Authors illustrations

Despite these advantages, the nested logit approach was deemed unsuitable for the present study due to limitations associated with the available dataset.¹ In addition, the study sought to account for potential sample selection bias arising from the fact that only firms participating in cross-border trade or digital transactions could meaningfully report on interoperability and e-payment constraints. Accordingly, the study adopted a three-step probit model with sample selection based on the seminal framework developed by James Heckman (1979). The Heckman selection approach was considered more appropriate because it corrects for non-random sample selection while simultaneously estimating the determinants of enterprise participation and e-payment adoption behaviour within a coherent econometric framework.

4.0 Findings and Discussions

Table 2 presents the results of the three probit models estimated in stage 1, stage 2 and stage 3. Prior to running the three models, benchmark dummies were set for the categorical explanatory variables. The findings reveal that cross-border e-payment interoperability in the EAC is constrained less by firm characteristics and more by structural weaknesses embedded within the region's regulatory, technological and market architecture.

Table 2: Probit Regression Results

	Stage 1: Decision to use or not to use e-payment option		Stage 2: Decision to use card versus non-card e-payment option		Stage 3: Decision use bank versus non-bank e-payment option	
	e-payment usage decision (=1 if e-payment is used, 0 otherwise i.e., do not use)		Card e-payment usage decision (=1 if card used for e-payments, 0 otherwise i.e., do not use cards)		Bank versus non-bank e-payment usage (=1 if bank-based e-payment is used, 0 otherwise i.e., non bank-based e-payment option)	
	Probit Regression	Marginal Effects	Probit Regression	Marginal Effects	Probit Regression	Marginal Effects
Firm Size (Ref: Small)						
Medium	0.066 (0.085)	0.012 (0.015)	-0.061 (0.113)	-0.007 (0.014)	-0.061 (0.113)	-0.007 (0.013)
Large	-0.075 (0.117)	-0.014 (0.022)	-0.164 (0.151)	-0.019 (0.016)	-0.164 (0.151)	-0.018 (0.016)
Legal Status (Ref: Sole proprietorship)						
Partnership	0.000 (0.103)	0.0524 (0.019)	0.019 (0.139)	0.002 (0.016)	0.019 (0.139)	0.002 (0.016)
Limited partnership	0.094 (0.131)	0.017 (0.023)	-0.054 (0.156)	-0.006 (0.017)	-0.054 (0.156)	-0.006 (0.017)
Shareholding company with non-traded shares or shares traded privately	0.106 (0.152)	0.019 (0.027)	0.315 (0.172)	0.043 (0.043)	0.315 (0.172)	0.043 (0.025)
Shareholding company with shares traded on the stock market	0.355 (0.382)	0.06 (0.058)	0.038 (0.435)	0.005 (0.053)	0.038 (0.435)	0.004 (0.053)
Years in Business Group (Ref: 0-10 Years)						

¹ The data adopted for use in this study lacked the hierarchical and sequential choice structure required for reliable nested logit estimation.

	Stage 1: Decision to use or not to use e-payment option		Stage 2: Decision to use card versus non-card e-payment option		Stage 3: Decision use bank versus non-bank e-payment option	
	e-payment usage decision (=1 if e-payment is used, 0 otherwise i.e., do not use)		Card e-payment usage decision (=1 if card used for e-payments, 0 otherwise i.e., do not use cards)		Bank versus non-bank e-payment usage (=1 if bank-based e-payment is used, 0 otherwise i.e., non bank-based e-payment option)	
	Probit Regression	Marginal Effects	Probit Regression	Marginal Effects	Probit Regression	Marginal Effects
11-20 Years	0.154 (0.089)	0.028 (0.016)	0.032 (0.127)	0.003 (0.013)	0.032 (0.127)	0.003 (0.013)
21-40 Years	0.058 (0.107)	0.011 (0.020)	0.294 (0.142)	0.036 (0.018)	0.293 (0.142)	0.036 (0.017)
41-60 Years	-0.272 (0.170)	-0.060 (0.035)	0.467 (0.227)	0.063 (0.035)	0.467 (0.227)	0.063 (0.035)
Above 60 Years	-0.177 (0.283)	-0.035 (0.057)	0.096 (0.389)	0.011 (0.045)	0.095 (0.389)	0.011 (0.045)
International Certification (Ref: No)						
Yes	0.088 (0.135)	0.016 (0.024)	-0.126 (0.164)	-0.014 (0.018)	-0.126 (0.164)	-0.014 (0.017)
Internet Disruption Experience (Ref: Yes)						
No	-0.102 (0.099)	-0.018 (0.017)	-0.074 (0.124)	-0.009 (0.015)	-0.074 (0.123)	-0.009 (0.015)
The establishment does not have an internet connection	-0.205* (.111)	-0.038 (0.020)	-0.166 (0.151)	-0.019 (0.017)	-0.166 (0.150)	-0.019 (0.017)
Average Cost per Transaction (Ref: 1% or less)						
Above 1% but below 5%	0.683*** (0.089)	0.136 (0.018)	0.190 (0.125)	0.023 (0.014)	0.190 (0.125)	0.023 (0.014)
5% to below 10%	1.230*** (0.203)	0.210 (0.024)	-0.420 (0.252)	-0.037 (0.019)	-0.420 (0.252)	-0.036 (0.019)
10% to below 20%	0.369 (0.242)	0.079 (0.048)	0.162 (0.339)	0.019 (0.043)	0.162 (0.339)	0.019 (0.043)
Country (Ref: Kenya)						
Rwanda	-1.703*** (0.139)	-0.339 (0.028)	1.540 (0.165)	0.216 (0.031)	1.540 (0.165)	0.216 (0.031)
Tanzania	-1.807*** (0.143)	-0.376 (0.029)	1.768 (0.176)	0.288 (0.037)	1.768 (0.176)	0.288 (0.037)
Uganda	-0.287* (0.149)	-0.022 (0.011)	0.330 (0.171)	0.015 (0.008)	0.330 (0.171)	0.015 (0.008)
Constant	1.572***		-2.397 (0.207)		-2.396 (0.207)	

At the first stage, internet access, transaction costs and country-specific effects emerged as the strongest determinants of e-payment adoption for cross-border transactions. Firms without internet connectivity were significantly less likely to use digital payment systems. This points to the critical role of digital infrastructure in enabling interoperable cross-border finance. This finding reflects broader infrastructural disparities across the EAC, where unreliable internet connectivity, high broadband costs and weak digital ecosystems continue to limit seamless financial integration. Additionally, the results suggest that enterprises experiencing transaction costs above 1% were more likely to adopt e-payments. Thus, despite being exposed to high fees, firms increasingly depend on digital channels to participate in regional commerce. This trend underscores a

deeper problem. That is, cross-border payments in the EAC remain expensive due to exchange rate conversion costs, reliance on correspondent banking systems and duplicated compliance procedures.

Country-level disparities were equally evident. Relative to Kenya, firms in Rwanda, Tanzania and Uganda were significantly less likely to use e-payments. Kenya's stronger performance reflects the maturity of its digital financial ecosystem, particularly the entrenchment of mobile money platforms and more developed payment infrastructure. In contrast, lower adoption levels elsewhere in the region point to fragmented regulatory frameworks, uneven fintech development and inconsistent payment system modernization across EAC member states. Divergent KYC and AML/CFT requirements, restrictive licensing regimes and data localization rules continue to increase compliance costs and operational friction for payment service providers operating across borders.

The second and third stages reveal some notable insights regarding interoperability. Firms in Rwanda and Tanzania were more likely to rely on card-based and bank-based payment systems relative to Kenyan firms, where mobile money and non-bank providers dominate. This reflects the dichotomy in nature of payment ecosystems within the region. While Kenya's mobile money revolution has accelerated domestic digital payments, the dominance of "on-us" transactions within large provider networks reduces incentives for interoperability with regional systems and smaller competitors. Consequently, cross-border transactions remain siloed within national payment architectures.

Summary, Conclusion and Policy Recommendations

The study demonstrates that cross-border digital payment interoperability within the EAC remains uneven, fragmented and heavily influenced by disparities in the enabling infrastructural and regulatory frameworks. While Kenya has developed a highly integrated mobile-first digital payments ecosystem dominated by non-bank fintech platforms, Tanzania continues to face significant interoperability bottlenecks, high transaction costs and limited formal digital payment penetration. Uganda exhibits strong mobile money adoption but still retains substantial dependence on informal and cash-based systems, whereas Rwanda reflects a transitional payment structure supported by strong policy commitment toward digitalization.

The econometric findings further reveal that internet access, transaction costs and country-level digital ecosystem maturity are the strongest determinants of e-payment adoption. Therefore, achieving an efficient and interoperable regional payments ecosystem will require harmonized regulatory frameworks, investment in enabling digital infrastructure, adopting standardized payment protocols and stronger integration between banks, fintech firms and regional settlement platforms across the EAC. As such, the study recommends to authorities to consider:

- **Harmonizing Regional Payment Regulations**

EAC member states should establish a unified regional framework for KYC, AML/CFT compliance, licensing and data governance to reduce regulatory duplication, lower compliance costs and facilitate seamless cross-border operations for payment service providers.

- **Investing in Shared Digital Payment Infrastructure**

The region should accelerate the adoption of common technical standards such as ISO 20022 and strengthen regional payment switches and real-time settlement systems to reduce interoperability failures, settlement delays and dependence on correspondent banking networks.

- **Promoting Inclusive and Competitive Interoperability**

Regulations should require dominant payment providers and mobile money operators to support open-access interoperability frameworks while expanding affordable internet access, digital identification systems and digital literacy initiatives to enhance SME participation in regional digital commerce.

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