



Mobile Payment Services and Financial Inclusion: Evidence from Mobile-Money Agents in Muganza Sector, Nyaruguru District, Rwanda

Uwase Nkusi Diana

University of Kigali, Rwanda

Email: uwase.amoura@gmail.com

Abstract: Rwanda reports high headline financial inclusion (96% of adults in 2024), yet rural disparities persist; Nyaruguru District records 10% financial exclusion, more than twice the national rate of 4%. This study examined the effect of four mobile-payment-service dimensions—money-transfer services, deposit-and-withdrawal services, payment-service efficiency, and mobile-banking services—on financial inclusion among mobile-money agents in Muganza Sector, Nyaruguru District. A quantitative explanatory, cross-sectional design was adopted. From a validated population of 450 active registered mobile-money agents, 212 were selected by simple random sampling using Yamane's formula and surveyed with a structured five-point Likert questionnaire. Data were analysed using descriptive statistics, Cronbach's alpha, Pearson correlation, and multiple linear regression, with multicollinearity assessed through the variance inflation factor. All constructs were reliable ($\alpha = 0.843\text{--}0.905$). The four dimensions correlated positively and significantly with financial inclusion ($r = 0.479\text{--}0.533$) and jointly explained 53.4% of its variance (adjusted R-squared = 0.534; $F(4, 207) = 61.51, p < .001$). Mobile-banking services had the strongest effect despite the lowest ratings, and all four null hypotheses were rejected. The study recommends improving agent float, strengthening payment reliability, and promoting underused mobile-banking products.

Keywords: Financial inclusion, Mobile money, Mobile banking, Payment services, Rwanda

How to cite this work (APA):

Uwase, N. D. (2026). Mobile Payment Services and Financial Inclusion: Evidence from Mobile-Money Agents in Muganza Sector, Nyaruguru District, Rwanda. *Journal of Research Innovation and Implications in Education*, 10(3), 2959 – 2169. <https://doi.org/10.59765/vr7r>

1. Introduction

Access to appropriate and affordable financial services enables households to save, transact, receive transfers, access credit, and absorb financial shocks. Despite the global expansion of digital finance, exclusion remains substantial, with roughly 1.4 billion adults unbanked as of 2021 (Demirgüç-Kunt et al., 2022). Mobile payment services have become a principal instrument for extending inclusion where conventional banking infrastructure is thin, allowing users to transfer funds, deposit and withdraw cash, and pay bills without travelling to a branch. Inclusion is now understood as more than account ownership; it encompasses active usage, affordability, service quality, and the capacity to manage everyday needs and shocks

(Alliance for Financial Inclusion, 2019; World Bank, 2025).

In Sub-Saharan Africa, mobile money has driven much of this expansion, and agent networks are central to it. Agents provide the physical cash-in and cash-out points that make electronic value usable, functioning as the practical link between platforms and clients who lack easy branch access (Mothobi and Kebotsamang, 2024). At the East African level, evidence indicates that mobile money helps households manage shocks and improves welfare through stronger remittance networks (Jack and Suri, 2014; Munyegera and Matsumoto, 2016; Suri and Jack, 2016).

Rwanda exemplifies both this progress and its unevenness. The FinScope 2024 survey reported that 96% of adults were financially included and 92% formally served, yet 4%

remained excluded nationally and several districts exceeded that rate (Access to Finance Rwanda, 2024). Nyaruguru District recorded 10% exclusion. The National Financial Inclusion Roadmap 2026–2030 accordingly shifts emphasis from basic access toward meaningful usage, resilience, and financial health, and highlights the role of electronic-money-institution agents and persistent urban–rural gaps in agent distribution (Banque Nationale du Rwanda and Ministry of Finance and Economic Planning, 2026).

Two problems motivate this study. First, national averages mask rural shortfalls: in Muganza Sector of Nyaruguru District, where one in ten adults is excluded, the quality and reliability of agent-delivered services plausibly determine whether nearby clients use formal services regularly and meaningfully. Second, and more fundamentally for research, much existing evidence treats mobile money as a single undifferentiated variable. In practice it comprises distinct dimensions—money transfers, cash-in and cash-out, payment efficiency, and mobile banking—that may bear on inclusion in different ways and to different degrees. Treating them as one obscures where the leverage lies.

The research gap is therefore threefold. Contextually, most evidence derives from Kenya and Uganda and from client or household samples, leaving rural Rwandan, agent-level evidence scarce. Conceptually, the undifferentiated treatment of mobile money obscures how its distinct dimensions operate. Empirically, the last-mile agent perspective—which directly governs float, reliability, and client support—is underrepresented. Addressing this gap is justified because agents are the channel through which rural inclusion is actually delivered, and identifying which service dimension matters most offers direct guidance for operators and regulators seeking to lift a rural district above the national exclusion rate.

The study is significant on several fronts. For policymakers and regulators, it provides locality-specific evidence on the service-quality issues that affect agent-level delivery and meaningful use, supporting efforts to strengthen digital financial inclusion in rural areas. For mobile network operators and agent-network managers, it identifies practical priorities for agent support, liquidity management, transaction reliability, and client education. For academics, it contributes agent-level evidence on perceived financial-inclusion outcomes at the sector level and offers a basis for future client-level, qualitative, or longitudinal research.

The general objective was to examine the effect of mobile payment services on financial inclusion among selected mobile-money agents in Muganza Sector, Nyaruguru District. The specific objectives were to examine the effect of (i) money-transfer services, (ii) deposit-and-withdrawal services, (iii) payment-service efficiency, and (iv) mobile-

banking services on financial inclusion. Each objective was tested as a null hypothesis of no significant effect (H_{01} – H_{04}).

2. Literature Review

2.1 Conceptualising Financial Inclusion

Financial inclusion is a multidimensional construct spanning access to, and use of, appropriate, affordable, quality financial services—payments, savings, credit, and insurance—and, increasingly, whether those services build users' financial resilience (Alliance for Financial Inclusion, 2016; World Bank, 2025). Rwandan policy reflects this shift: with headline access already high, attention has moved to deeper usage and financial health (Access to Finance Rwanda, 2024; Banque Nationale du Rwanda and Ministry of Finance and Economic Planning, 2026). The present study adopts this broader conception, measuring inclusion through access, usage, affordability, quality, and resilience.

2.2 Money-Transfer Services

Money-transfer services—person-to-person, domestic, cross-network, and remittance transactions—are the most common use of mobile money and the most studied. Jack and Suri (2014) found in Kenya that mobile-money transfers improved households' ability to respond to negative shocks by strengthening risk-sharing networks, while Munyegera and Matsumoto (2016) found in rural Uganda that mobile-money access raised household welfare partly through easier remittances. These findings position transfers as a primary pathway into regular formal-account use, although they derive largely from client and household samples rather than from the agents who deliver the service.

2.3 Deposit-and-Withdrawal Services

Deposit-and-withdrawal (cash-in and cash-out) services are the foundational layer that makes electronic value practical, especially where clients still transact largely in cash (Mas and Radcliffe, 2010). Their usefulness depends on agent availability, adequate float, and short turnaround; absent reliable liquidity, accounts deliver little practical value (Demirgüç-Kunt et al., 2022). This dependence on agent-side float is precisely what client-focused studies tend to leave unexamined.

2.4 Payment-Service Efficiency

Payment-service efficiency—the speed, accuracy, reliability, and affordability of bill, merchant, and government payments—shapes whether clients trust and continue using digital channels. Ozili (2018) argued that digital finance advances inclusion when services are reliable and appropriate, while GSMA (2025) reported that

delays and failures erode confidence. The mechanism is one of sustained trust, yet its agent-level determinants in rural settings remain thinly documented.

2.5 Mobile-Banking Services

Mobile-banking services extend beyond transfers and cash-in/cash-out to savings, credit, account linkages, and insurance-related products. Suri and Jack (2016) showed that such services are the most capable of moving users from basic access toward deeper participation and resilience, yet they typically require greater client understanding and trust. Whether this deeper value is realised at the rural last mile—where agent capacity and client awareness are weakest—remains an open question.

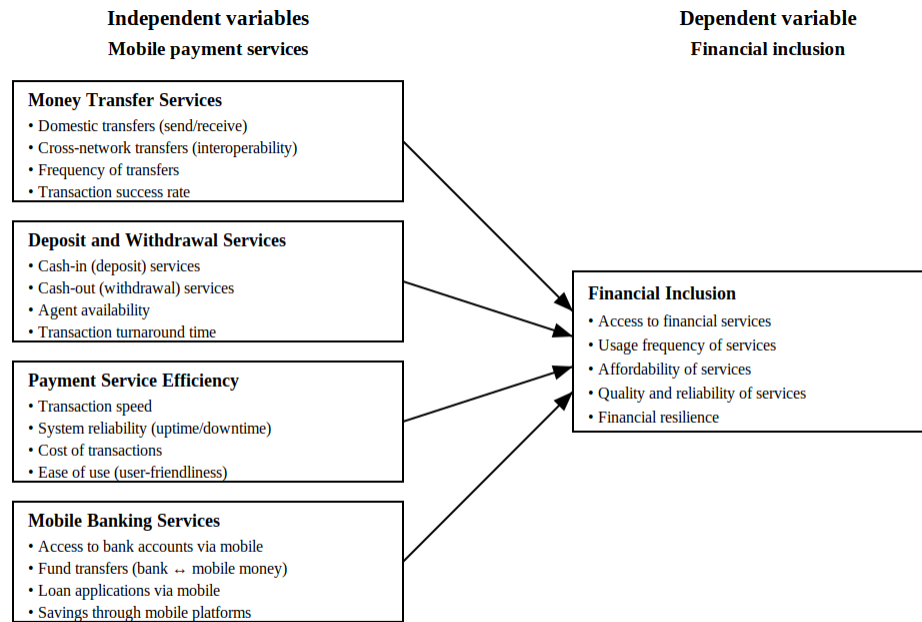
2.6 Theoretical Framework

Three theories connect the dimensions to inclusion. The Technology Acceptance Model (Davis, 1989; Venkatesh and Davis, 2000) holds that usage depends on perceived usefulness and ease of use; it underwrites payment-service efficiency and mobile-banking services, whose uptake hinges on clients finding them fast, reliable, and comprehensible. Financial Intermediation Theory (Diamond and Dybvig, 1983; Freixas and Rochet, 2008) frames agents as last-mile intermediaries who reduce transaction costs and information gaps; it underwrites money-transfer and deposit-and-withdrawal services, which connect clients to the formal system. The Financial Inclusion Framework (Alliance for Financial Inclusion, 2016) supplies the multidimensional measurement of the dependent variable across access, usage, affordability, quality, and resilience.

Taken together, the three theories yield a coherent expectation for this study. The Technology Acceptance Model and Financial Intermediation Theory explain why the four service dimensions should each raise inclusion—through perceived usefulness and ease of use on the one hand, and through reduced transaction and information costs on the other—while the Financial Inclusion Framework defines the outcome those services are expected to improve. Financial inclusion should therefore improve when mobile payment services are accessible, reliable, efficient, useful, and supported by agents able to help clients use formal digital services, a proposition the present analysis tests empirically at the agent level.

2.7 Conceptual Framework

The study conceptualises the four mobile-payment-service dimensions as independent variables acting on financial inclusion as the dependent variable. Money-transfer services are expected to influence inclusion by enabling clients to send and receive money through formal digital channels; deposit-and-withdrawal services by allowing clients to move between cash and electronic value; payment-service efficiency by improving the speed, reliability, accuracy, and convenience of payments; and mobile-banking services by expanding access to deeper products such as savings and credit. Financial inclusion is measured through access, usage, affordability, service quality, and financial resilience. The framework, summarised in Figure 1, therefore proposes that improvements in agent-level mobile-payment-service delivery translate into stronger financial-inclusion outcomes among the clients those agents serve.



Source: Researcher, 2026

Figure 1: Conceptual Framework

Source. Adapted from the researcher's conceptual framework (2026).

2.8 Research Gap

Synthesising the literature, three gaps converge. Contextually, most evidence derives from Kenya and Uganda and from client or household samples, so rural Rwandan, agent-level evidence is scarce. Conceptually, mobile money is usually treated as one variable, obscuring differences among its dimensions. Empirically, the last-mile agent perspective—which directly governs float, reliability, and client support—is underrepresented. This study addresses all three gaps by disaggregating four dimensions and examining them from the agent's vantage point in a high-exclusion rural sector.

3. Methodology

3.1 Research Design

The study adopted a quantitative explanatory, cross-sectional design, appropriate for testing the effect of the four service dimensions on financial inclusion using numerical data and statistical inference (Creswell, 2014).

3.2 Study Population

The target population comprised 450 active registered mobile-money agents (owners and authorised attendants) in Muganza Sector. The roster was reviewed, validated, and de-duplicated so that each eligible agent point appeared once (Mugenda and Mugenda, 2003).

3.3 Sample Size and Sampling Procedure

Applying Yamane's (1967) finite-population formula at a 5% margin of error and 95% confidence level yielded a sample of 212. Each eligible agent point was assigned a unique identification number, and 212 respondents were drawn by simple random sampling using a computer-generated random-number procedure, reducing selection bias.

3.4 Inclusion and Exclusion Criteria

Eligible respondents were owners or authorised attendants aged 18 years or above, registered under MTN Rwanda and/or Airtel Rwanda, operating for at least three months, present during data collection, and consenting. Agent points outside the sector, inactive, or operating for fewer than three months were excluded, as were respondents not directly involved in daily mobile-money operations.

3.5 Data Collection Instrument

Data were collected via a structured questionnaire administered in English. Section A captured demographic and operational characteristics; Sections B to F measured the four independent constructs and financial-inclusion outcomes, each with six items on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). No qualitative instrument was used.

3.6 Validity

Content validity was assessed through the Content Validity Index (CVI), following established scale-development guidance (Boateng et al., 2018). The questionnaire was reviewed by the supervisor and research-methodology experts for relevance, clarity, wording, and coverage. Thirty of 36 items were judged valid, yielding a CVI of 0.83, above the 0.70 threshold considered acceptable for content validity (Polit et al., 2007).

3.7 Reliability

Internal consistency was assessed with Cronbach's alpha. As shown in Table 1, all five constructs exceeded the 0.70 threshold recommended by Nunnally (1978), ranging from 0.843 for payment-service efficiency to 0.905 for financial-inclusion outcomes, confirming that the items measuring each construct were internally consistent.

Table 1: Reliability Test Results

Construct	Number of items	Cronbach's alpha
Money-transfer services	6	0.888
Deposit-and-withdrawal services	6	0.880
Payment-service efficiency	6	0.843
Mobile-banking services	6	0.867
Financial-inclusion outcomes	6	0.905

Note. Field data, 2026.

3.8 Data Processing and Analysis

Responses were coded, edited for completeness and consistency, and de-duplicated; the six items under each construct were transformed into composite mean scores. Analysis in SPSS proceeded through descriptive statistics, Pearson correlation, and multiple linear regression, with significance assessed at 5% and multicollinearity checked through the variance inflation factor (VIF).

3.9 Regression Model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

where Y = financial inclusion; X_1 = money-transfer services; X_2 = deposit-and-withdrawal services; X_3 = payment-service efficiency; and X_4 = mobile-banking services.

3.10 Ethical Considerations

Formal permission was obtained before fieldwork. Participation was voluntary and informed; respondents

were free to withdraw; confidentiality was maintained through numeric codes; data were stored securely; and findings were reported only in aggregate.

4. Results and Discussion

4.1 Response Rate and Respondent Profile

All 212 distributed questionnaires were completed and returned (100%), reflecting in-person administration and on-the-spot completion. As shown in Table 2, respondents were 54.2% male and 45.8% female; 85.9% were aged 25 years or above; and secondary education predominated (41.5% A-Level or upper secondary and 35.8% O-Level or lower secondary). Most were experienced operators, with 85.8% having at least one year of agent experience, and 42.5% were registered with MTN only, 21.7% with Airtel only, and 35.8% with both networks.

Table 2: Demographic Characteristics of Respondents

Variable	Category	n	%
Gender	Male	115	54.2
	Female	97	45.8
Age group	18–24 years	30	14.2
	25–34 years	89	42.0
	35 years and above	93	43.9
Education level	Primary	20	9.4
	O-Level / Lower Secondary	76	35.8
	A-Level / Upper Secondary	88	41.5
	TVET certificate or diploma	28	13.2
Marital status	Single	92	43.4
	Married	120	56.6
Agent experience	3–12 months	30	14.2
	1–2 years	74	34.9
	3–5 years	69	32.5
	More than 5 years	39	18.4
Registered network	MTN Mobile Money only	90	42.5
	Airtel Money only	46	21.7
	Both networks	76	35.8

Note. Field data, 2026. N = 212.

4.2 Descriptive Statistics

Mean scores summarise agents' average level of agreement (1 = strongly disagree to 5 = strongly agree), and standard deviations show response variation. Across constructs, transfer services rated highest and mobile-banking services lowest.

Table 3 reports money-transfer items. Person-to-person (P2P) transfers were rated highest ($M = 4.16$, $SD = 0.95$), while international remittance availability was lowest ($M = 2.83$, $SD = 1.17$), indicating that domestic rather than international transfers are the operative local pathway.

Table 3: Descriptive Statistics for Money-Transfer Services

Statement	M	SD
P2P transfers enable clients to send and receive money quickly	4.16	0.95
Bank-to-wallet and wallet-to-bank transfers are available to clients	3.88	1.08
International remittance services are available at my agent point	2.83	1.17
P2P transfers encourage clients to use active mobile-money accounts	3.99	1.05
Transfer services help previously unserved clients access formal services	3.97	1.09
Reliable transfer services encourage clients to use formal channels	4.03	1.03

Note. Field data, 2026. M = mean; SD = standard deviation.

Table 4 reports deposit-and-withdrawal items. Ease of cash-in was rated highest ($M = 3.92$, $SD = 1.14$), while adequate float for cash-out was lowest ($M = 3.14$, $SD = 1.22$), signalling a liquidity constraint on agents.

Table 4: Descriptive Statistics for Deposit-and-Withdrawal Services

Statement	M	SD
Cash-in services are easy for clients to use	3.92	1.14
Cash-out services are available without excessive waiting time	3.34	1.20
Adequate float enables clients to complete cash-out transactions	3.14	1.22
Deposit and withdrawal services encourage active mobile-money use	3.77	1.22
Deposit and withdrawal services reduce reliance on informal cash handling	3.56	1.15
Cash-in and cash-out transactions are quick and convenient	3.70	1.15

Note. Field data, 2026. M = mean; SD = standard deviation.

Table 5 reports payment-efficiency items. Confidence from fast, accurate payments was highest (M = 3.79, SD = 1.13), while merchant-payment reliability was lowest (M = 3.16, SD = 1.20), identifying a specific friction point.

Table 5: Descriptive Statistics for Payment-Service Efficiency

Statement	M	SD
Bill payments are processed quickly and accurately	3.38	1.15
Government-service payments are completed efficiently	3.34	1.14
Merchant payments operate reliably	3.16	1.20
Fast and accurate payments increase clients' confidence	3.79	1.13
Bill-payment services reduce clients' reliance on cash	3.50	1.15
Efficient payment services support financial inclusion	3.66	1.17

Note. Field data, 2026. M = mean; SD = standard deviation.

Table 6 reports mobile-banking items, consistently the lowest-rated construct. Agents' ability to explain products was highest (M = 3.45, SD = 1.23), while mobile-loan-driven credit access was lowest (M = 2.97, SD = 1.27), suggesting limited uptake and understanding of deeper services.

Table 6: Descriptive Statistics for Mobile-Banking Services

Statement	M	SD
I assist clients to use available mobile-savings products	3.36	1.16
Mobile-loan services improve clients' access to credit	2.97	1.27
Mobile-banking services expand access beyond basic cash transactions	3.23	1.23
I can explain available mobile-banking products clearly	3.45	1.23
Mobile-banking services help clients save and manage financial shocks	3.14	1.27
Mobile-banking services improve clients' financial well-being	3.24	1.27

Note. Field data, 2026. M = mean; SD = standard deviation.

Table 7 reports financial-inclusion outcomes. Regular active-account use was highest (M = 3.99, SD = 1.11), while consistent saving and credit access was lowest (M = 3.54, SD = 1.20), indicating that deeper financial services remain less developed than basic usage.

Table 7: Descriptive Statistics for Financial-Inclusion Outcomes

Statement	M	SD
Most clients regularly use an active mobile-money account	3.99	1.11
Clients use mobile-money services beyond cash-in and cash-out	3.61	1.14
Mobile-payment services meet clients' everyday financial needs	3.79	1.10
Regular mobile-money users manage financial emergencies better	3.67	1.15
Regular mobile-money users save and access credit more consistently	3.54	1.20
Mobile-payment services improve clients' financial resilience	3.67	1.16

Note. Field data, 2026. M = mean; SD = standard deviation.

4.3 Correlation Analysis

As shown in Table 8, all four dimensions correlated positively and significantly with financial inclusion: mobile banking ($r = .533$), payment efficiency ($r = .529$),

deposit-and-withdrawal ($r = .514$), and money transfers ($r = .479$), all $p < .01$. Inter-predictor correlations were positive but moderate ($r = .210-.411$), suggesting no serious multicollinearity, later confirmed by VIF.

Table 8: Correlations Among Study Variables

Variable	1	2	3	4	5
1. Money-transfer services	1				
2. Deposit-and-withdrawal services	.309	1			
3. Payment-service efficiency	.378	.390	1		
4. Mobile-banking services	.249	.210	.411	1	
5. Financial inclusion	.479	.514	.529	.533	1

Note. Field data, 2026. $N = 212$. All reported correlations are significant at $p < .01$ (2-tailed).

4.4 Regression Analysis

The model was strong and significant: $R = 0.737$, $R^2 = 0.543$, adjusted $R^2 = 0.534$, with a standard error of the

estimate of 0.642 (Table 9). The four dimensions jointly explained 53.4% of the variance in financial inclusion, leaving 46.6% to factors outside the model.

Table 9: Model Summary

Model	R	R ²	Adjusted R ²	SE of estimate
1	0.737	0.543	0.534	0.642

Note. Field data, 2026. Predictors: money-transfer, deposit-and-withdrawal, payment-efficiency, and mobile-banking services.

The analysis of variance in Table 10 confirms overall significance, $F(4, 207) = 61.51$, $p < .001$, indicating that the

four dimensions jointly had a significant effect on financial inclusion.

Table 10: Analysis of Variance for the Regression Model

Source	SS	df	Mean square	F	Sig.
Regression	101.361	4	25.340	61.51	<.001
Residual	85.284	207	0.412		
Total	186.645	211			

Note. Field data, 2026. Dependent variable: financial inclusion.

Table 11 presents the coefficients. All four predictors were positive and significant ($p < .001$). Ranked by standardised effect, mobile-banking services led ($\beta = 0.336$), followed by deposit-and-withdrawal ($\beta = 0.299$), money transfers (β

$= 0.232$), and payment efficiency ($\beta = 0.187$). Tolerance values (0.611–0.692) and VIF values (1.45–1.64) confirmed no multicollinearity concern.

Table 11: Regression Coefficients (Dependent Variable: Financial Inclusion)

Predictor	B	SE	β	t	p	Tol.	VIF
Constant	0.512	0.181	—	2.83	.005	—	—
Money-transfer services	0.256	0.062	0.232	4.13	<.001	0.643	1.56
Deposit-and-withdrawal services	0.301	0.059	0.299	5.10	<.001	0.611	1.64
Payment-service efficiency	0.203	0.059	0.187	3.44	<.001	0.692	1.45
Mobile-banking services	0.329	0.052	0.336	6.33	<.001	0.674	1.48

Note. Field data, 2026. Tol. = tolerance; VIF = variance inflation factor.

4.5 Hypothesis Testing

All four predictors returned $p < .001$, so all null hypotheses (H_0 – H_4) were rejected. Each dimension has a positive, statistically significant effect on financial inclusion as reported by agents.

4.6 Discussion of findings

The results confirm that each disaggregated dimension independently predicts financial inclusion, and that disaggregation is analytically worthwhile, since the four dimensions differ markedly in both effect size and reported uptake.

Money-transfer services carried a significant effect ($\beta = 0.232$), consistent with evidence that mobile transfers widen access and displace informal channels (Mbiti and Weil, 2011; Suri and Jack, 2016). The high P2P rating alongside the low remittance rating suggests that domestic transfers, not international ones, are the operative pathway locally, contextualising the East African findings within a rural Rwandan setting.

Deposit-and-withdrawal services were the second-strongest predictor ($\beta = 0.299$), affirming agents' role as intermediaries who convert cash to electronic value and back (Mas and Radcliffe, 2010). The weak float rating ($M = 3.14$) is the practical caveat: liquidity limits, rather than client demand, appear to bound this dimension's contribution, echoing the liquidity dependence noted by Demirgüç-Kunt et al. (2022).

Payment-service efficiency was significant but the weakest predictor ($\beta = 0.187$), in line with the Technology Acceptance Model's premise that perceived usefulness and ease of use sustain usage (Davis, 1989; Venkatesh and Davis, 2000). The low merchant-reliability rating ($M = 3.16$) indicates a specific, addressable friction point rather than a general failure of the channel.

Mobile-banking services produced the study's central finding: the strongest effect on inclusion ($\beta = 0.336$) yet the lowest descriptive ratings ($M = 2.97$ – 3.45). This impact–uptake paradox aligns with the argument that meaningful inclusion depends on beneficial use of deeper services, not merely account access (Demirgüç-Kunt et al., 2022; Suri and Jack, 2016). It implies substantial latent value: the services that most advance inclusion are precisely those clients use and understand least, pointing to awareness, trust, and agent-capacity constraints rather than a ceiling on impact. Read together, the findings suggest that inclusion in this setting is currently carried by transactional services (transfers and cash-in/cash-out), while its greatest untapped depth lies in mobile banking.

5. Conclusion and Recommendations

5.1 Conclusions

Mobile payment services significantly shape financial inclusion among mobile-money agents in Muganza Sector, jointly explaining 53.4% of its variance. In relation to the first objective, money-transfer services had a positive, significant effect, driven locally by domestic person-to-person transfers. In relation to the second objective, deposit-and-withdrawal services were the second-strongest driver but were constrained by inadequate float. In relation to the third objective, payment-service efficiency had a significant though weaker effect, limited by merchant-payment reliability. In relation to the fourth objective, mobile-banking services exerted the strongest effect despite being the least used, revealing the study's central impact–uptake paradox and the clearest opportunity for deeper inclusion.

Taken together, these results answer the general objective: when mobile payment services are disaggregated, each of the four dimensions exerts a positive and statistically significant effect on financial inclusion among agents in this rural setting, and all four null hypotheses were accordingly rejected. The study establishes that inclusion in Muganza Sector is presently carried by transactional services, namely transfers and cash-in and cash-out, while its greatest untapped depth lies in mobile banking, whose high impact coexists with its lowest uptake. Its principal contribution is therefore to reframe the rural-inclusion challenge in this context from expanding basic access toward activating the latent depth that agent-delivered mobile-banking services can provide.

5.2 Recommendations

Drawing directly on the findings, the following recommendations are directed at the stakeholders best placed to act on each service dimension. They are ordered to reflect the practical priorities the results identify, from the transactional services that already sustain inclusion to the higher-impact but underused mobile-banking services.

1. For mobile-money operators (MTN, Airtel): keep money-transfer services reliable, fast, and affordable; strengthen merchant-, bill-, and government-payment reliability to convert efficiency into client trust; and promote mobile-banking products such as savings and credit through simplified access and clearer product information, given their high impact and low uptake.
2. For agents and agent-network managers: prioritise float and liquidity management, since inadequate float is the binding constraint on the second-strongest dimension, and invest in product knowledge so that mobile-banking services can be explained clearly to clients.

3. For policymakers and regulators (Banque Nationale du Rwanda, Ministry of Finance and Economic Planning) and local authorities: target rural, high-exclusion districts such as Nyaruguru with agent-support measures and digital-financial-literacy campaigns aligned with the National Financial Inclusion Roadmap 2026–2030, so that the national shift from access toward meaningful usage reaches the last mile.

5.3 Limitations

Several limitations qualify these findings. Inclusion was measured as perceived and reported by agents rather than directly among clients, so the outcome reflects an agent vantage point and may be subject to common-method and self-report bias, including recall and social-desirability effects. The cross-sectional design precludes causal inference. Although the response rate was complete, the study was confined to a single sector, which bounds generalisability. The study also used quantitative data only, without qualitative interviews that could have explained float-management and transaction challenges more deeply. These limitations indicate the value of future client-level, multi-sector, longitudinal, and mixed-methods research.

5.4 Contribution

The study contributes disaggregated, agent-level, rural-Rwandan evidence to a literature dominated by broad-brush, client-based, Kenyan and Ugandan work. Its distinctive empirical contribution is the identification of the mobile-banking impact–uptake paradox—the highest-impact dimension being the least used—which reframes the rural-inclusion challenge from expanding access to activating latent depth and localises where agent-side intervention would most improve meaningful inclusion.

References

- Access to Finance Rwanda. (2024). *Rwanda FinScope survey 2024*. Kigali, Rwanda: Author.
- Alliance for Financial Inclusion. (2016). *Financial inclusion: Basic terminology* (2nd ed.). Kuala Lumpur, Malaysia: Author.
- Alliance for Financial Inclusion. (2019). *Measuring financial inclusion: Core set of financial inclusion indicators*. Kuala Lumpur, Malaysia: Author.
- Banque Nationale du Rwanda, and Ministry of Finance and Economic Planning. (2026). *Rwanda national financial inclusion roadmap 2026–2030*. Kigali, Rwanda: Authors.
- Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quinonez, H. R., and Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: A primer. *Frontiers in Public Health*, 6, 149.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: SAGE.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340.
- Demirgüç-Kunt, A., Klapper, L., Singer, D., and Ansar, S. (2022). *The Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19*. Washington, DC: World Bank.
- Diamond, D. W., and Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of Political Economy*, 91(3), 401–419.
- Freixas, X., and Rochet, J. C. (2008). *Microeconomics of banking* (2nd ed.). Cambridge, MA: MIT Press.
- GSMA. (2025). *The state of the industry report on mobile money 2025*. London, UK: Author.
- Jack, W., and Suri, T. (2014). Risk sharing and transactions costs: Evidence from Kenya’s mobile money revolution. *American Economic Review*, 104(1), 183–223.
- Mas, I., and Radcliffe, D. (2010). Mobile payments go viral: M-PESA in Kenya. In P. Chuhun-Pole and M. Angwafo (Eds.), *Yes Africa can: Success stories from a dynamic continent* (pp. 353–370). Washington, DC: World Bank.
- Mbiti, I., and Weil, D. N. (2011). *Mobile banking: The impact of M-Pesa in Kenya* (NBER Working Paper No. 17129). Cambridge, MA: National Bureau of Economic Research.
- Mothobi, O., and Kebotsamang, K. (2024). The impact of network coverage on adoption of fintech and financial inclusion in Sub-Saharan Africa. *Journal of Economic Structures*, 13, Article 5.
- Mugenda, O. M., and Mugenda, A. G. (2003). *Research methods: Quantitative and qualitative approaches* (2nd ed.). Nairobi, Kenya: African Centre for Technology Studies Press.
- Munyegera, G. K., and Matsumoto, T. (2016). Mobile money, remittances, and household welfare: Panel evidence from rural Uganda. *World Development*, 79, 127–137.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

- Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), 329–340.
- Polit, D. F., Beck, C. T., and Owen, S. V. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*, 30(4), 459–467.
- Suri, T., and Jack, W. (2016). The long-run poverty and gender impacts of mobile money. *Science*, 354(6317), 1288–1292.
- Venkatesh, V., and Davis, F. D. (2000). A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science*, 46(2), 186–204.
- World Bank. (2025). *Financial inclusion*. Washington, DC: Author.
- Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). New York, NY: Harper & Row.