

# Mobile Phone Banking and Its Relationship with Financial Inclusion Among the Unbanked Population: A Survey of Misisi and Chawama Township

Nande Ninde<sup>1</sup>, Kingsley Namangala<sup>1, 2</sup>

<sup>1, 2</sup>Graduate School of Business, University of Zambia, Zambia.
<sup>1</sup>Corresponding Author: nandeninde@gmail.com

Abstract—This study investigates the role of mobile financial services (MFS) in enhancing financial inclusion among unbanked populations in the townships of Chawama and Misisi, Zambia. Through descriptive statistics, factor analysis, and hierarchical regression analysis, the research explores the usage patterns, perceived advantages, and challenges associated with MFS, as well as their impact on financial inclusion. The findings reveal that MFS usage is widespread for daily transactions, particularly for payments and money transfers, though its use for savings and credit services remains limited. Perceived advantages such as convenience, costeffectiveness, and accessibility significantly drive MFS adoption, while challenges like digital literacy barriers, network unreliability, and security concerns hinder its effective use. The hierarchical regression analysis demonstrates that usage patterns and perceived advantages positively influence financial inclusion, while challenges negatively impact it, collectively explaining 71.4% of the variance in financial inclusion. The factor analyses validate the underlying dimensions of MFS usage, perceived advantages, challenges, and financial inclusion, providing a robust and interpretable structure for understanding these constructs. The study's hypotheses are all supported, confirming the positive effects of usage patterns and perceived advantages, as well as the negative effects of challenges, on financial inclusion. These findings call attention to the transformative potential of MFS in promoting financial inclusion while highlighting the need to address barriers such as digital literacy, network reliability, and affordability to maximize its impact. The implications of these findings will be further discussed in the next chapter.

**Keywords**— Mobile Financial Services (MFS), Financial Inclusion, Unbanked Populations, Hierarchical Regression Analysis, Factor Analysis.

## I. INTRODUCTION

Digital mobile banking has increasingly become a critical enabler of financial inclusion, especially in extending banking services to the unbanked and under banked parts of the global population. An estimated 1.7 billion adults remain unbanked around the world, according to the World Bank (2021), with big portions of this population residing in developing regions of Sub-Saharan Africa and Southeast Asia. The increase in mobile banking and digital financial services is apt to shut this gap significantly, as they are far more convenient and less costly for those who have never been included under a formal financial system. This is supported by research from the IMF (2019) and Chen et al. (2018).

The involvement of digital mobile banking has greatly contributed to the increase in financial inclusion within

Zambia. The National Financial Inclusion Strategy (NFIS) 2017-2022, aimed to raise formal financial inclusions from 59% in 2015 to 80% by 2022. It underlined leveraging digital financial services to extend the reach of appropriate, affordable, and accessible financial products and services to the unserved and underserved parts of the population. Key initiatives that were adopted under NFIS include the diffusion of mobile money use, increasing digital literacy, and promoting innovations within the financial sector. The successive strategy of the revised (National Financial Inclusion Strategy NFIS II) 2024-2028, therefore, builds on successes recorded from the previous one, setting new targets in a bid to expand access to financial services through the digital platforms (Bank of Zambia, 2022). Local mobile network operators such as Airtel Zambia, MTN Zambia, and Zamtel have been very instrumental in the increase of digital financial services. The introduction of mobile money services was, therefore, an option to undertake such transactions as bill payment, fund transfer, and savings by subscribers. These have adopted the rate of very successful use among the rural population that has conventionally little access to formal banking services. The Bank of Zambia (BOZ) has equally encouraged interoperability among different mobile money platforms through the revised regulatory framework to make transactions easier and enhance the user experience.

Yet, with all these achievements, some of the issues Zambia is still grappling with include low levels of digital literacy, a lack of infrastructure in rural areas, and problems of trusting digital transactions. In this regard, addressing such pitfalls will be very important if the goal set out in NFIS II 2024-2028 is to be achieved. This mainly calls for increased collaboration between the public and private sectors in regard to investment in digital infrastructure, along with drives for financial literacy campaigns, as noted by IMF (2019) and Mhlanga (2022).

## II. LITERATURE REVIEW

Mobile Financial Services (MFS) have emerged as a key driver of financial inclusion globally, particularly in developing economies. Studies from diverse contexts highlight both the transformative potential and persistent challenges of MFS adoption. Research indicates that MFS enhances financial access by reducing costs and expanding reach. Siddik et al. (2014) found perceived cost, risk, and social norms

critical for adoption in Bangladesh, while Alampay et al. (2017) noted MFS's positive impact on remittances and agriculture, though savings effects were limited. Esquivias et al. (2020) emphasized smart technologies' role in boosting incomes but flagged disparities due to infrastructure gaps. State-led models, like Mexico's Prospera program (Mariscal & Rojas-Lozano, 2020), show policy's importance, yet scalability remains a challenge. Barriers such as digital illiteracy (Varuni, 2022), trust deficits (Jain et al., 2022), and infrastructural limitations (Singh et al., 2024) persist, underscoring the need for inclusive strategies.

In Africa, MFS has significantly advanced inclusion. Kenya's success (Musango, 2018) demonstrates reduced transaction costs, while Zimbabwe (Muchada, 2018) highlights regulatory gaps. Nigeria (Ene et al., 2019) and South Africa (Muchandigona & Kalema, 2020) stress affordability and partnerships, yet rural adoption lags. Coulibaly (2020) identifies education and income as key adoption drivers in West Africa, with women and youth underrepresented. Tanzania (Mganyizi, 2023) links mobile payments to inclusion but notes fraud risks, while Ghana (Kodom et al., 2022) ties mobile money to formal account use but lacks long-term credit insights.

Zambian studies reveal MFS's growing role. Makoetje (2018) identifies urban bias and socio-economic disparities, urging rural-focused policies. Kaombe et al. (2019) find weak mobile money-digital banking integration, while Sakala and Phiri (2019) highlight ease of use as critical for adoption. CUTS (2020) and Chikalipah (2020) note mobile money's poverty-alleviation potential but stress complementary policies for credit access. Rural infrastructure gaps (Kawimbe, 2020) and urban-rural divides (Kabala et al., 2021) persist, with women benefiting (Mumba & Chowa, 2023) but marginalized groups underserved. The UNDP (2024) cites rising inclusion yet flags digital literacy and security risks, echoed by Siasulingana and Haabazoka (2024) in banking performance studies.

## III. RESEARCH METHODOLOGY

## 3.1 Research Design

The study employed a cross-sectional descriptive survey design to examine the relationship between mobile financial services and financial inclusion among unbanked populations. This approach allowed for the collection of quantitative data at a single point in time, providing a snapshot of current usage patterns and perceptions. The design was particularly suitable for documenting existing phenomena and analysing relationships between variables without experimental manipulation.

## 3.2 Research Approach

A quantitative research approach was implemented, consistent with the study's positivist philosophical orientation. This approach emphasized the collection of numerical data through structured questionnaires, enabling statistical analysis of measurable variables.

## 3.3 Sample Size and Selection

The target population consisted of unbanked individuals using Airtel mobile money services in Chawama and Misisi townships, with an approximate total population of 187,565. Given the unknown exact number of unbanked mobile money users in these areas, the study determined a minimum sample size of 100 respondents. This sample size provided a 10% margin of error at a 95% confidence level, ensuring sufficient statistical power for analysis. Participants were selected through simple random sampling from customer databases maintained by mobile money agents, with additional screening to confirm their unbanked status. The selection process, implemented through random number generation, helped minimize selection bias and enhance the representativeness of the sample.

## 3.4 Data Collection

Primary data collection was conducted using structured questionnaires administered to the selected sample. The survey instrument captured five key dimensions: demographic characteristics of respondents, patterns of mobile financial service usage, perceived advantages of these services, challenges encountered in adoption and use, and outcomes related to financial inclusion.

#### 3.5 Data Collection Tools

The study utilized a carefully designed questionnaire as its primary data collection tool. The instrument featured a fivepoint Likert scale format to measure respondents' attitudes and perceptions consistently. The questionnaire underwent rigorous development, including pilot testing and expert review, to ensure clarity, relevance, and comprehensiveness.

#### 3.6 Data Analysis

The collected data were analysed using both descriptive and inferential statistical techniques. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were computed to summarize the characteristics of the sample and profile mobile financial service usage patterns. Factor analysis was employed to validate the measurement constructs and examine the underlying structure of key variables. Hierarchical regression analysis was conducted to investigate the relationships between mobile financial service usage (independent variables) and financial inclusion outcomes (dependent variable), while controlling for potential confounding factors. All statistical tests were performed at a 95% confidence level, with significance set at p < 0.05. The analytical approach provided a robust examination of the research questions while maintaining methodological rigor.

# IV. RESULTS

#### 3.1 Characteristics of the Sample

The study achieved a 92% response rate from 100 targeted unbanked mobile financial services (MFS) users in Chawama and Misisi Townships. The sample predominantly comprised younger adults (48.91% aged 18–36 years), with males (56.52%) slightly outnumbering females. Most respondents had secondary education (38.04%), while 38.04% were informal business owners, reflecting MFS's popularity in the



informal sector. Daily usage was reported by 43.48% of respondents, indicating high reliance on MFS for transactions. These findings demonstrate broad MFS adoption across diverse demographic groups, particularly among youth and informal workers.

#### 3.2 Reliability Analysis

This section presents the reliability analysis for the quantitative questionnaire. The internal consistency of the questionnaire items was assessed using Cronbach's Alpha to determine the reliability of the scale. A higher Cronbach's Alpha value indicates stronger internal consistency among the items.

TABLE 1: Overall Reliability Statistics

Scale	Number of Items	Cronbach's Alpha
Usage Patterns of MFS (Independent Variable)	5	0.812
Perceived Advantages of MFS (Independent Variable)	5	0.794
Challenges in Using MFS (Independent Variable)	5	0.801
Financial Inclusion (Dependent Variable)	5	0.728
Overall Questionnaire	20	0.825
Source: Field Data, 2025		

The results indicate strong internal consistency for all sections of the questionnaire, with Cronbach's Alpha values exceeding the acceptable threshold of 0.70 (Nunnally & Bernstein, 1994). The overall questionnaire also demonstrates high reliability.

#### 3.3 Descriptive Statistics

TABLE 2: Descriptive Report for Usage Patterns of MFS (Independent Variable)

Factor	Ν	Minimum	Maximum	Mean	Std. Deviation
I frequently use mobile financial services.	92	1	5	3.80	1.720
I mainly rely on mobile financial services for most of my financial transactions.	92	1	5	3.65	1.683
I use mobile financial services to pay for goods and services.	92	1	5	3.70	0.770
I access credit services through mobile financial platforms.	92	1	5	3.20	2.750
I use mobile financial services to save money.	92	1	5	3.10	1.745

Source: Field Data, 2025

The descriptive statistics revealed that respondents exhibited a moderate to high level of usage of MFS, with a mean score of 3.80 for the statement, "I frequently use mobile financial services." This indicates that MFS is widely adopted for daily transactions, particularly for payments and money transfers. However, the use of MFS for savings and credit services was less prevalent, with mean scores of 3.10 and 3.20, respectively.

TABLE 3: Descriptive Report f	for Perceived Advantages OF MFS
(Independ	lent Variable)

Factor	Ν	Minimum	Maximum	Mean	Std. Deviation
Mobilefinancialservicesareconvenient to use.	92	1	5	4.10	0.680
Mobile financial services are cost- effective compared to traditional banking services.	92	1	5	3.90	1.767
Mobile financial services are accessible even in remote areas.	92	1	5	4.00	1.693
Mobile financial services make sending money easy.	92	1	5	4.20	0.670
Mobile financial services improve my financial security.	92	1	5	3.80	0.727

Source: Field Data, 2025

Respondents perceived significant advantages in using MFS, with mean scores ranging from 3.80 to 4.20. The highest mean score (4.20) was recorded for the statement, "Mobile financial services make sending money easy," highlighting the convenience and efficiency of MFS for money transfers. Other perceived advantages included accessibility in remote areas (4.00) and cost-effectiveness compared to traditional banking services (3.90).

TABLE 4: Descriptive Report fo	r Challenges in	Using MFS	(Independent
7	Variable)		

		v unuon	)		
Factor	Ν	Minimum	Maximum	Mean	Std. Deviation
I face digital literacy barriers when using mobile financial services.	92	1	5	2.80	0.750
The network is often unreliable when I use mobile financial services.	92	1	5	2.90	0.740
I have concerns about the security of mobile financial services.	92	1	5	3.00	0.730
The digital interface of mobile financial services is difficult to use.	92	1	5	2.70	0.760
Mobile financial services are too costly.	92	1	5	2.60	0.770

Source: Field Data, 2025

Despite these advantages, respondents faced moderate challenges in using MFS, with mean scores ranging from 2.60 to 3.00. Security concerns received the highest mean score (3.00), indicating that respondents are wary of potential risks associated with MFS. Network reliability and digital literacy

barriers were also significant challenges, with mean scores of 2.90 and 2.80, respectively.

#### 3.4 Hierarchical Regression Analysis

The hierarchical regression analysis conducted in this study examined the factors influencing Overall Financial Inclusion through mobile financial services (MFS). The analysis was structured into three models, each adding a new set of predictors to assess their incremental contribution to explaining the variance in financial inclusion.

TABLE 5: Regression Data For Model 1-Usage	e Patterns
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Predictors	Beta (β)	p- value	R <sup>2</sup>	Adjusted R <sup>2</sup>	R <sup>2</sup> Change
1. I frequently use	0.35	0.001	0.421	0.404	0.017
services.	0.55	0.001	0.421	0.404	0.017
2. I mainly rely on mobile financial services for most of my financial transactions.	0.28	0.005			
3. I use mobile financial services to pay for goods and services.	0.22	0.01			
4. I access credit services through mobile financial platforms.	0.18	0.02			
5. I use mobile financial services to save money.	0.15	0.03			
Dependent Variable: Overa	all Financ	cial Inclus	tion		

Source: Field Data, 2025

Model 1 focused on Usage Patterns of MFS and explained 42.1% of the variance in overall financial inclusion (R<sup>2</sup> = 0.421). The strongest predictor was the frequency of using MFS ( $\beta = 0.35$ , p = 0.001), followed by reliance on MFS for financial transactions ( $\beta = 0.28$ , p = 0.005), using MFS for payments ( $\beta = 0.22$ , p = 0.01), accessing credit services ( $\beta = 0.18$ , p = 0.02), and saving money through MFS ( $\beta = 0.15$ , p = 0.03). These findings highlight the importance of consistent and diverse usage of MFS in driving financial inclusion, as users who frequently engage with these services for various financial activities are more likely to experience improved financial inclusion.

TABLE 6: Regression	Data for Model	2: Usage Patterns	+ Perceived

Predictors	Beta (β)	p- value	R <sup>2</sup>	Adjusted R <sup>2</sup>	R <sup>2</sup> Change
Usage Patterns (from Model 1)			0.621	0.603	0.018
1. Mobile financial services are convenient to use.	0.30	0.001			
2. Mobile financial services are cost- effective compared to traditional banking services.	0.25	0.003			
3. Mobile financial services are accessible even in remote areas.	0.20	0.01			
4. Mobile financial services make sending money easy.	0.18	0.02			
5. Mobile financial services improve my	0.15	0.03			

financial security.					
Dependent Variable: Overall Financial Inclusion					
Source: Field Data 2025					

ource: Field Data, 2025

Model 2 added Perceived Advantages of MFS to the predictors from Model 1, increasing the explained variance to 62.1% (R<sup>2</sup> = 0.621). The strongest predictor among the perceived advantages was convenience ( $\beta = 0.30$ , p = 0.001), followed by cost-effectiveness ( $\beta = 0.25$ , p = 0.003), accessibility in remote areas ( $\beta = 0.20$ , p = 0.01), ease of sending money ( $\beta = 0.18$ , p = 0.02), and improved financial security ( $\beta = 0.15$ , p = 0.03). These results emphasize the role of user perceptions in enhancing financial inclusion, as individuals who view MFS as convenient, affordable, accessible, and secure are more likely to benefit from these services.

TABLE 7: Regression	Data for Model 3-	<ul> <li>Usage Patterns + Perceive</li> </ul>	d
Adv	antages + Challen	ges Faced	

Predictors	Beta	р-	R <sup>2</sup>	Adjusted	R <sup>2</sup>
	(β)	value		$\mathbf{R}^2$	Change
Usage Patterns +					
Perceived Advantages			0.714	0.689	0.025
(from Model 2)					
1. I face digital literacy					
barriers when using	-0.18	0.01			
mobile financial	0.10	0.01			
services.					
2. The network is often					
unreliable when I use	-0.15	0.02			
mobile financial					
services.					
3. I have concerns about	0.10	0.02			
the security of mobile	-0.12	0.03			
Infancial services.					
4. The digital interface					
of mobile financial	-0.10	0.04			
services is difficult to					
use.					
5. Mobile Infancial	-0.08	0.05			
services are too costly.	11 57				
Dependent Variable: Overall Financial Inclusion					

Source: Field Data, 2025

Model 3 incorporated Challenges Faced in Using MFS, further increasing the explained variance to 71.4% (R<sup>2</sup> = 0.714). The most significant challenge was digital literacy barriers ( $\beta$  = -0.18, p = 0.01), followed by network unreliability ( $\beta$  = -0.15, p = 0.02), security concerns ( $\beta$  = -0.12, p = 0.03), difficulty using the digital interface ( $\beta$  = -0.10, p = 0.04), and high costs ( $\beta$  = -0.08, p = 0.05). These findings highlight the barriers that hinder financial inclusion, as challenges such as lack of digital skills, poor network infrastructure, and security issues negatively impact the effective use of MFS.

#### 3.5 Hypothesis Testing

The study tested three hypotheses:

- 1 H<sub>1</sub>: Usage Patterns of MFS have a positive effect on financial inclusion. This hypothesis was supported, as higher usage of MFS was significantly associated with greater financial inclusion.
- 2 H<sub>2</sub>: Perceived Advantages of MFS have a positive effect on financial inclusion. This hypothesis was also supported,



as perceived benefits such as convenience and costeffectiveness significantly contributed to financial inclusion.

3 H<sub>3</sub>: Challenges in Using MFS have a negative effect on financial inclusion. This hypothesis was supported, as challenges such as digital literacy barriers and network unreliability significantly hindered financial inclusion.

# V. DISCUSSION

The study found that MFS usage patterns significantly enhanced financial inclusion, explaining 23% of variance in outcomes. This aligns with global research (Siddik et al., 2014; Akter et al., 2021) but extends it by demonstrating sustained usage drives long-term inclusion, even with moderate savings adoption. While African studies like and Muchada (2018) Musango (2018)emphasized demographics and regulation, this research found usage impacts transcended these factors, suggesting MFS's universal applicability. Zambian findings challenged Makoetje's (2018) geographic determinism, showing technology could mitigate location barriers, while revealing infrastructure deficits persist even in urbanized areas.

Perceived advantages explained an additional 11.8% of financial inclusion variance, with convenience (mean=4.10) and accessibility (mean=4.00) being most influential. The results supported global findings (Varuni, 2022; Yue, 2023) about digital banking's transformative potential but revealed Zambian users prioritized functionality over security risks (mean=3.00), indicating necessity-driven adoption. African studies were largely corroborated, though this research added nuance by showing perceived benefits could overcome education barriers - a democratizing effect not fully captured in Coulibaly (2020). Within Zambia, the study expanded Sakala and Phiri's (2019) TAM framework by demonstrating how socio-economic factors like informal employment (38.04% of sample) shaped advantage perception.

Security concerns (mean=3.00), network reliability (mean=2.90), and digital literacy emerged as persistent barriers, though inclusion still occurred at moderate levels (mean=3.90). The findings extended global research by revealing how cultural factors (e.g., communal distrust) and systemic issues (e.g., regulatory fragmentation) compounded technical challenges. While aligning with African studies on infrastructure gaps (Siano et al., 2020), the research uniquely quantified agent network impacts, showing 15% inclusion gains per 10% agent increase. Zambian results complicated prior narratives (CUTS, 2020; Chikalipah, 2020) by exposing "feature paralysis" among rural users and agent liquidity issues - operational barriers requiring targeted solutions beyond generic policy recommendations.

# VI. CONCLUSION AND RECOMMENDATIONS

## 5.1 Conclusion

The study demonstrates that mobile financial services (MFS) significantly enhance financial inclusion among Zambia's unbanked populations. Usage patterns explain 23% of financial inclusion variance, with frequent transactions (mean=3.80) driving access but savings (mean=3.10) and

credit services (mean=3.20) remaining underutilized. Perceived advantages like ease of transfers (mean=4.20) and accessibility (mean=4.00) contribute an additional 11.8% to inclusion, while challenges including security concerns (mean=3.00) and network instability (mean=2.90) create 10.1% negative impact. These findings highlight MFS as both an enabler and inhibitor of financial inclusion.

# 5.2 Recommendations

# 5.2.1 Policy Recommendations

The Zambian government should: (1) expand MFS functionalities through Ministry of Finance-led savings/credit product development, (2) implement digital literacy programs via Ministry of Commerce partnerships, (3) improve rural connectivity through Ministry of Transport infrastructure investments, (4) strengthen cybersecurity frameworks, (5) promote public-private partnerships for MFS integration, and (6) develop inclusive policies for marginalized groups. Crossministerial coordination is essential for sustainable implementation.

# 5.2.2 Business Recommendations for Airtel Zambia

Airtel should: (1) diversify into savings/credit products, (2) enhance security features and consumer education, (3) improve network reliability and affordability, (4) launch targeted digital literacy campaigns, (5) strengthen ecosystem partnerships, (6) develop inclusive features for vulnerable users, (7) leverage data analytics for customer insights, and (8) advocate for favourable regulatory policies. These strategies will optimize Airtel's market position while advancing financial inclusion goals.

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