



A Descriptive Study of Mobile Banking Adoption and Financial Inclusion Outcomes in Developing Countries

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ABSTRACT

The advent of mobile banking technology has revolutionized financial services delivery in developing countries, offering unprecedented opportunities for financial inclusion. This paper examines the role of mobile banking in expanding access to financial services among previously unbanked populations, analysing its impact on economic development, poverty reduction, and financial stability. Through a comprehensive review of empirical evidence from various developing economies, this study finds that mobile banking has significantly enhanced financial inclusion rates, particularly in sub-Saharan Africa and South Asia. However, challenges including regulatory frameworks, digital literacy, and infrastructure constraints continue to limit its full potential. The paper concludes with policy recommendations for maximizing the benefits of mobile banking while addressing existing barriers to widespread adoption.

Introduction

Financial inclusion, defined as access to and usage of formal financial services by individuals and businesses, has emerged as a critical development priority in the 21st century. The World Bank estimates that approximately 1.7 billion adults worldwide remain unbanked, with the majority residing in



developing countries. Traditional banking infrastructure has historically failed to reach these populations due to high operational costs, geographic barriers, and regulatory constraints.

The emergence of mobile banking technology has fundamentally transformed the financial services landscape in developing countries. Mobile banking refers to the use of mobile devices to access financial services, including payments, transfers, savings, and credit facilities. This technology has demonstrated remarkable potential to bridge the financial inclusion gap by leveraging the widespread adoption of mobile phones, even in areas with limited traditional banking infrastructure.

Kenya's M-Pesa, launched in 2007, represents one of the most successful mobile banking implementations, serving over 40 million users and facilitating billions of dollars in transactions annually (Suri & Jack, 2016). The success of M-Pesa has inspired similar initiatives across Africa, Asia, and Latin America, creating a global movement toward digital financial inclusion.

This paper aims to provide a comprehensive analysis of mobile banking's impact on financial inclusion in developing countries.

Research objectives

- (1) Examining the current state of mobile banking adoption in developing economies
- (2) Analysing the impact on financial inclusion metrics in developing nations
- (3) Providing policy recommendations for enhancing mobile banking's contribution to financial inclusion.

Literature Review

The theoretical foundation for mobile banking's impact on financial inclusion rests on several economic principles. Transaction cost theory suggests that mobile banking reduces the costs associated with financial service delivery, making it economically viable to serve previously excluded populations (Williamson, 1985). Network effects theory explains how mobile banking platforms become more valuable as more users join the system, creating positive feedback loops that drive adoption (Katz & Shapiro, 1994).

Sarma (2008) developed a comprehensive index measuring financial inclusion across three dimensions: accessibility, availability, and usage. Mobile banking technology addresses all three dimensions by



increasing the physical accessibility of financial services, improving their availability through 24/7 access, and enhancing usage through user-friendly interfaces and reduced transaction costs.

Suri and Jack (2016) conducted a comprehensive study of M-Pesa's impact in Kenya, finding that mobile banking increased financial inclusion rates by 10 percentage points and lifted 194,000 households out of poverty. Their analysis revealed particularly strong effects among female-headed households, demonstrating mobile banking's potential to address gender gaps in financial access.

Munyegera and Matsumoto (2016) examined mobile banking adoption in Uganda, finding that mobile money services increased the probability of having a bank account by 36 percentage points. The study also revealed positive effects on savings behaviour, with mobile money users more likely to save for emergencies and future investments.

Islam et al. (2018) analysed the impact of mobile banking on rural households, finding significant improvements in financial inclusion metrics. Their research demonstrated that mobile banking access increased the likelihood of formal savings by 23% and formal credit access by 18%. These findings suggest that mobile banking can serve as a gateway to broader financial services engagement.

Kunt & Klapper, 2013). This cost reduction makes it economically feasible for financial service providers to serve low-income populations. Mobile banking leverages existing mobile network infrastructure, which has experienced rapid expansion in developing countries.

The GSMA (2019) reports that mobile network coverage reaches 95% of the global population, including remote rural areas that lack traditional banking infrastructure. This infrastructure advantage enables mobile banking to reach previously unserved populations. Mobile banking platforms often incorporate innovative design features that address specific barriers to financial inclusion. For example, many mobile banking services operate through simple SMS interfaces that work on basic mobile phones, removing the need for smartphone ownership or internet connectivity.

Asongu, S. A., & Nwachukwu, J. C. (2018) This study examines how economic openness moderates mobile banking's impact on financial development across 48 Sub-Saharan African countries from 2004-2015. Using system GMM estimation, the authors find that mobile banking's positive effects on financial inclusion are amplified by 35% in countries with greater economic openness. Mobile phone penetration increases financial inclusion by 0.23 percentage points per additional subscription per 100 people. The



research reveals complementarity between mobile banking and traditional financial services, with mobile adoption increasing bank account ownership by 18 percentage points in open economies. Regional variations show East African countries achieving larger gains than West African nations, highlighting contextual factors' importance.

Batista, C., & Vicente, P. C. (2020) This randomized controlled trial analyses mobile money's impact on savings behaviour among 3,000 smallholder farmers across 120 villages in Mozambique. The intervention included mobile money training and incentives to examine adoption patterns. Results show mobile money access increased formal savings by 33 percentage points and savings amounts by 47%. Mobile banking particularly benefited farmers with volatile incomes, enabling consumption smoothing across agricultural cycles. Participating farmers invested 23% more in quality seeds and fertilizers, improving agricultural productivity. The study identifies trust and digital literacy as critical barriers, with targeted training increasing adoption by 28 percentage points. Gender differences emerged, with women showing higher savings adoption but lower business transaction usage.

Beck, T., Pamuk, H., Ramrattan, R., & Uras, B. R. (2018) This comprehensive analysis examines payment system evolution's impact on financial inclusion across 37 developing countries over 15 years. The research demonstrates that mobile payment adoption increases formal account ownership by 23 percentage points and credit access by 18 percentage points. Significant heterogeneity exists across demographic groups, with rural populations experiencing larger financial inclusion gains than urban residents. Mobile banking reduces gender gaps in financial access by 12 percentage points, with women showing higher adoption for savings and remittances. Regulatory frameworks emerge as crucial success determinants, with supportive regulations achieving 40% higher adoption rates. The study emphasizes tailored approaches for different population segments to maximize mobile banking's financial inclusion potential.

Bongomin, G. O. C. et.al (2016) This study examines social capital's mediating role between financial literacy and mobile banking adoption using survey data from 390 rural Ugandan households. Employing structural equation modelling, the research reveals social capital significantly mediates the financial literacy-mobile banking relationship, explaining 42% of adoption variance. Mobile banking users with higher social capital show 60% higher likelihood of using multiple financial services. Community-based mobile money agents prove crucial for building trust and facilitating adoption, with agent quality significantly predicting continued usage. Peer influence emerges as critical, with individuals 3.2 times



more likely to adopt if friends and family are users. Mobile banking adoption improves financial inclusion scores by 0.35 points, with strongest effects among women and young adults.

Demirgüç Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2022) The Global Findex Database 2021 analyses mobile banking adoption across 123 countries using data from 125,000+ adults. Mobile money account ownership in Sub-Saharan Africa reached 33% in 2021, compared to 12% globally. Mobile money users show 40% higher likelihood of formal saving and 60% higher probability of receiving digital government payments. Key adoption barriers include trust issues (22%), insufficient funds (31%), and limited digital literacy (18%). The COVID-19 pandemic accelerated mobile banking adoption, with digital payment usage increasing 35% in developing countries. This comprehensive dataset establishes crucial baselines for understanding mobile banking's financial inclusion role while highlighting the importance of addressing technological and socioeconomic barriers to maximize adoption rates across diverse populations.

Koomson, I., Villano, R. A., & Hadley, D. (2020) This study examines multidimensional financial inclusion's relationship with poverty reduction across 31 Sub-Saharan African countries, focusing on mobile banking's contribution. The authors develop a comprehensive financial inclusion index incorporating access, usage, and quality dimensions. Each unit increase in the mobile banking component associates with 1.8 percentage point reduction in extreme poverty rates. Mobile banking most strongly impacts rural household vulnerability reduction, with adopting households showing 25% lower poverty probability. Poverty reduction effects strengthen when combined with financial literacy programs, suggesting complementary interventions enhance effectiveness. Mobile banking proves particularly effective reaching women and young adults, traditionally excluded from formal financial services. The research provides robust evidence of mobile banking's poverty alleviation role and comprehensive financial inclusion approaches' importance.

Munyegera, G. K., & Matsumoto, T. (2016) Using panel data from 2,716 rural Ugandan households, this study employs difference-in-differences methodology to analyse mobile money's welfare impacts. Mobile money adoption increases remittance receipt probability by 48 percentage points and amounts by 47%. Adopting households experience 15% higher consumption expenditure and 23% increased agricultural investment. Mobile money serves as crucial risk-sharing and consumption-smoothing mechanism in areas with limited traditional banking infrastructure. Users show 36 percentage points higher likelihood of formal bank account ownership, suggesting mobile banking functions as a gateway



to broader financial services. The research provides valuable evidence of mobile banking's welfare impacts in rural settings and its role connecting remote populations to formal financial systems, demonstrating significant household-level benefits beyond basic transaction facilitation.

Riley, E. (2018) This randomized controlled trial investigates mobile money's role in facilitating risk-sharing mechanisms among 1,208 households across 48 Tanzanian villages. Mobile money adoption improves risk-sharing capabilities, with adopting households receiving 67% more transfers during adverse shocks compared to controls. The service enables more efficient informal insurance networks, reducing consumption volatility by 23% among users. Mobile money particularly benefits households with limited social networks, expanding risk-sharing access beyond traditional kinship ties. Distance to traditional banking moderates' mobile money's impact, with strongest effects in remote areas lacking financial infrastructure. Mobile money adoption increases 15 percentage points following village-level economic shocks, suggesting endogenous adoption patterns. This research provides crucial insights into mobile banking's household risk management role and economic resilience improvement potential in developing countries.

Shapiro, A. H., & Mandelman, F. S. (2021) This theoretical and empirical study examines digital payment adoption's relationship with economic development across 86 developing countries. The authors develop a dynamic general equilibrium model analysing mobile banking's effects on aggregate productivity and growth. A 10 percent point increase in digital payment adoption correlates with 0.8% higher annual GDP per capita growth. Mobile banking reduces transaction costs by 67% compared to traditional banking, making services accessible to previously excluded populations. Countries with higher mobile banking penetration experience accelerated financial deepening, with financial inclusion indices improving 0.15 points per 10% mobile money adoption increase. Network effects emerge as critical adoption drivers, with utility increasing exponentially as user bases expand. The study provides theoretical grounding for understanding mobile banking's macroeconomic impacts and policy insights for leveraging digital financial services.

Methodology

This paper employs a systematic literature review methodology to analyse the impact of mobile banking on financial inclusion in developing countries. The research strategy involved searching academic databases including JSTOR, CanLit, and Google Scholar for peer-reviewed articles published between



2010 and 2024. Keywords included "mobile banking," "financial inclusion," "developing countries," "digital finance," and "mobile money."

Data from these studies were systematically extracted and analysed to identify common patterns, success factors, and barriers to mobile banking adoption. The analysis also incorporated secondary data from international organizations including the World Bank, International Monetary Fund, and GSMA to provide broader context on mobile banking trends and financial inclusion metrics.

Results and Analysis

Current State of Mobile Banking Adoption

Mobile banking adoption has experienced exponential growth in developing countries over the past decade. According to GSMA (2023), there were 1.35 billion registered mobile money accounts globally in 2022, representing a 12% increase from the previous year. Sub-Saharan Africa leads in mobile money adoption, with 548 million registered accounts, followed by South Asia with 232 million accounts.

The data reveals significant regional variations in mobile banking adoption patterns. East Africa demonstrates the highest penetration rates, with countries like Kenya, Tanzania, and Uganda achieving mobile money penetration rates exceeding 70% of the adult population. In contrast, other regions show more modest adoption rates, with Latin America and the Caribbean achieving 23% penetration and the Middle East and North Africa reaching 18% penetration.

These regional differences reflect varying factors including regulatory environments, mobile network infrastructure quality, and existing financial sector development. Countries with supportive regulatory frameworks and robust mobile network coverage tend to achieve higher adoption rates, while those with restrictive regulations or poor infrastructure face significant barriers.

Impact on Financial Inclusion Metrics

The empirical evidence demonstrates that mobile banking has substantially improved financial inclusion metrics across developing countries. Analysis of World Bank Global Findex data reveals that countries with higher mobile banking adoption rates consistently show better financial inclusion outcomes.

In Kenya, mobile banking has contributed to dramatic improvements in financial inclusion. The percentage of adults with access to formal financial services increased from 41% in 2009 to 83% in 2019, with mobile money services accounting for most of this improvement (Central Bank of Kenya, 2020).



Similar patterns emerge in other East African countries, with Tanzania and Uganda showing comparable improvements following mobile banking introduction.

The gender dimension of financial inclusion has also seen significant improvements through mobile banking. Research by Demirgüç-Kunt et al. (2018) found that mobile banking has reduced the gender gap in financial inclusion by 7 percentage points in sub-Saharan Africa. Women particularly benefit from mobile banking services due to their convenience and privacy, addressing traditional barriers that prevented women from accessing formal financial services.

Rural-urban financial inclusion gaps have also narrowed in countries with successful mobile banking implementation. In Ghana, mobile banking has reduced the rural-urban gap in financial inclusion from 25 percentage points in 2011 to 8 percentage points in 2019 (Bank of Ghana, 2020). This improvement reflects mobile banking's ability to overcome geographic barriers that traditionally limited rural access to financial services.

Economic Development Impact

Beyond financial inclusion metrics, mobile banking has demonstrated significant positive impacts on broader economic development outcomes. Suri and Jack (2016) found that M-Pesa adoption in Kenya increased consumption levels by 7-11% among households, with particularly strong effects on female-headed households. The study also documented improvements in occupational choice, with mobile banking enabling more individuals to engage in business activities and entrepreneurship.

The poverty reduction effects of mobile banking are particularly noteworthy. Analysis of household survey data from Kenya revealed that mobile banking access lifted approximately 194,000 households out of poverty, representing a 2% reduction in the poverty rate (Suri & Jack, 2016). These poverty reduction effects operate through multiple channels, including improved income smoothing, enhanced business opportunities, and reduced transaction costs for remittances.

Mobile banking has also facilitated improved risk management and consumption smoothing among low-income households. Research by Jack and Suri (2014) demonstrated that M-Pesa users were better able to maintain consumption levels during economic shocks, with the service providing an important insurance mechanism for vulnerable populations.



Success Factors

The analysis reveals several key factors that contribute to successful mobile banking implementation and adoption. First, supportive regulatory frameworks play a crucial role in enabling mobile banking growth. Countries like Kenya, Tanzania, and the Philippines have implemented proportionate regulatory approaches that balance innovation with consumer protection, creating enabling environments for mobile banking expansion.

Second, partnership models between mobile network operators and financial institutions have proven effective in combining telecommunications infrastructure with financial expertise. These partnerships leverage the comparative advantages of each sector, with mobile operators providing network infrastructure and customer reach while financial institutions contribute regulatory compliance and risk management capabilities.

Third, agent network development is critical for mobile banking success. Effective agent networks provide cash-in and cash-out services, enabling the crucial link between digital and physical money. Countries with dense, well-trained agent networks show higher mobile banking adoption and usage rates.

Fourth, product design that addresses specific user needs and preferences enhances adoption. Successful mobile banking services often incorporate features like bill payments, airtime purchases, and merchant payments that provide immediate value to users beyond basic money transfer functionality.

Barriers and Challenges

Despite significant progress, several barriers continue to limit mobile banking's potential impact on financial inclusion. Digital literacy remains a significant challenge, particularly among older adults and rural populations. Many potential users lack the basic digital skills necessary to effectively use mobile banking services, limiting adoption and usage.

Infrastructure constraints also pose challenges in some regions. While mobile network coverage has expanded rapidly, quality of service issues including poor connectivity and frequent network outages can undermine user confidence in mobile banking services. Additionally, limited electricity access in rural areas can restrict mobile phone charging and usage.



Regulatory uncertainty and restrictive policies have hindered mobile banking development in several countries. Some regulators have imposed overly restrictive requirements that limit innovation and competition in the mobile banking sector. Concerns about money laundering and terrorist financing have sometimes led to disproportionate regulatory responses that stifle mobile banking growth.

Trust and security concerns represent another significant barrier. Many potential users express concerns about the security of mobile banking transactions and the risk of fraud. These concerns are often exacerbated by limited consumer protection frameworks and inadequate redress mechanisms for mobile banking disputes.

Barriers to Mobile Banking Adoption

Barrier Type	Percentage of Unbanked Adults	Gender Impact	Source
Lack of Money	65%	Equal across genders	Demirgüç-Kunt et al. (2022)
No Mobile Phone	35%	Higher for women	World Bank Global Findex (2021)
Documentation Requirements	33%	Slightly higher for women	Demirgüç-Kunt et al. (2022)
Use of Intermediaries	14%	Equal across genders	World Bank Global Findex (2021)
Lack of Trust	22%	Higher for women	Demirgüç-Kunt et al. (2022)
Digital Literacy Issues	18%	Higher for women	Bongomin et al. (2016)

Policy Recommendations

Based on the analysis of mobile banking's impact on financial inclusion, several policy recommendations emerge to maximize the benefits while addressing existing barriers.



Regulatory Framework Enhancement

Governments should adopt proportionate regulatory approaches that balance innovation with consumer protection. This includes implementing tiered know-your-customer (KYC) requirements that allow for simplified account opening procedures while maintaining appropriate risk controls. Regulatory sandboxes can provide safe spaces for testing innovative mobile banking solutions without full regulatory burden.

Central banks should establish clear guidelines for mobile banking operations, including transaction limits, consumer protection requirements, and interoperability standards. These guidelines should be developed through consultation with industry stakeholders to ensure they are practical and supportive of innovation.

Infrastructure Development

Governments should continue investing in mobile network infrastructure, particularly in rural and underserved areas. This includes supporting the deployment of 4G and 5G networks that can support more sophisticated mobile banking services. Public-private partnerships can help mobilize private sector investment in network infrastructure while ensuring universal coverage.

Electricity access expansion is crucial for supporting mobile banking adoption. Governments should prioritize rural electrification programs and support alternative energy solutions like solar charging stations that can support mobile phone usage in off-grid areas.

Digital Literacy Programs

Comprehensive digital literacy programs are essential for maximizing mobile banking adoption. These programs should target vulnerable populations including women, elderly individuals, and rural communities. Training should cover basic mobile phone usage, understanding of mobile banking services, and security best practices.

Financial education should be integrated with digital literacy training to help users understand the benefits and risks of mobile banking services. Public-private partnerships can leverage mobile network operators' customer bases and distribution networks to deliver training programs at scale.

Economic Impact of Mobile Banking Adoption

Impact indicator	Effect Size	Country/Context	Source
Poverty Reduction	22% reduction in extreme poverty	Kenya (M-Pesa)	Suri & Jack (2016)
Household Savings Increase	21.3% increase	Kenya	Suri & Jack (2016)
Consumption Expenditure	15% increase	Rural Uganda	Munyegera & Matsumoto (2016)
Agricultural Investment	23% increase	Rural Uganda	Munyegera & Matsumoto (2016)
GDP Growth Correlation	0.8% per 10pp adoption	86 developing countries	Shapiro & Mandelman (2021)
Transaction Cost Reduction	67% reduction vs banks	Cross-country analysis	Beck et al. (2018)

Consumer Protection Enhancement

Robust consumer protection frameworks are necessary to build trust in mobile banking services. This includes establishing clear dispute resolution mechanisms, transparent fee structures, and adequate compensation schemes for service failures. Consumer protection agencies should be equipped with the technical expertise necessary to oversee mobile banking services effectively.

Data protection and privacy regulations should be strengthened to address growing concerns about digital financial services. Users should have clear rights regarding their personal and financial data, including the right to data portability and deletion.

Future Growth Projections and Potential

Indicator	Current Status	Projected Growth	Timeframe	Source
Mobile Network	95% global	98% by 2025	2025	GSMA (2019)



Coverage	population			
Agricultural Payment Digitalization	20% digitalized	60% potential	2030	Batista & Vicente (2020)
Financial Inclusion Rate (SSA)	55%	70% target	2025	World Bank Global Findex (2021)
Mobile Money Transaction Volume	\$1.2 trillion (2021)	\$2.5 trillion projected	2026	GSMA Mobile Money Report

Market Development Support

Governments should support the development of competitive mobile banking markets through appropriate licensing regimes and market entry facilitation. This includes allowing non-bank entities to provide mobile banking services where appropriate, subject to adequate regulatory oversight.

Interoperability requirements can help create more competitive markets by allowing users to transact across different mobile banking platforms. Standardized protocols and APIs can reduce switching costs and increase competition among service providers.

Conclusion

Mobile banking has emerged as a transformative force for financial inclusion in developing countries, demonstrating remarkable potential to expand access to formal financial services among previously unbanked populations. The empirical evidence reveals significant positive impacts on financial inclusion metrics, poverty reduction, and economic development outcomes.

The success of mobile banking in countries like Kenya, Tanzania, and Uganda demonstrates that appropriate regulatory frameworks, robust infrastructure, and effective partnerships between mobile operators and financial institutions can create enabling environments for digital financial inclusion. However, significant barriers remain, including digital literacy gaps, infrastructure constraints, and regulatory uncertainties. The analysis suggests that mobile banking's impact on financial inclusion is not automatic but depends on supportive policy environments and appropriate implementation strategies. Countries seeking to maximize mobile banking's benefits should focus on developing proportionate



regulatory frameworks, investing in infrastructure development, and implementing comprehensive digital literacy programs.

The potential of mobile banking to contribute to the United Nations Sustainable Development Goals, particularly Goal 1 (No Poverty) and Goal 8 (Decent Work and Economic Growth), suggests that continued support for mobile banking development represents a valuable investment in sustainable development. As technology continues to evolve, mobile banking services will likely become even more sophisticated and impactful, offering new opportunities for financial inclusion and economic empowerment in developing countries.

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