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UNDERSTANDING THE LONG-TERM SUSTAINABILITY AND PROFITABILITY OF MOBILE MONEY IN AFRICA

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Abstract

Background: Mobile money has revolutionized financial services in Africa, providing access to banking and financial services to millions of previously unbanked individuals. The proliferation of mobile phones coupled with innovative financial technologies has enabled this rapid expansion. Mobile money services have been pivotal in driving financial inclusion, fostering economic development, and reducing poverty across the continent. For example, M-Pesa in Kenya in 2007 became a game changer in financial inclusion and accessibility in Kenya. Safaricom developed M-Pesa, which allowed users to deposit, withdraw, and transfer money using their mobile phones, radically changing how Kenyans accessed financial services. Mobile money grew on the back of the rapid mobile communication expansion throughout Africa. The continent's expansive topography, lack of telecommunications infrastructure, and expanding population made it an excellent target for telecommunications carriers (both domestic and international). Despite substantial advances in mobile telecommunication and mobile money services, there is a huge research gap that requires immediate attention.
Methods: This study analyzed existing literature to identify the critical factors that contribute to or hinder the long-term sustainability and profitability of mobile money in Africa. It reviews and critiques literature from various reputable databases.
Results: Key issues include gender disparities in mobile money uptake and usage, lower levels of digital and financial literacy among rural communities, and a lack of understanding of the long-term sustainability and profitability of these services in competitive markets.
Conclusion: This study makes three key contributions to the body of knowledge. It provides a comprehensive overview of the evolution and current state of the mobile money ecosystem. The study highlights the significant economic and social impacts of mobile money adoption and the study identifies critical gaps in mobile money research.

Keywords: *Mobile Money, Sustainability and Profitability of Mobile Money, Mobile Money Adoption*

INTRODUCTION

Background

For numerous decades, there has been exponential growth in the use of ICTs in various fields (Kimwise, 2017), for example, mobile telecommunication has grown rapidly throughout Africa. The continent's expansive topography, lack of telecommunications infrastructure, and expanding population made it an excellent target for telecommunications carriers (both domestic and international) (World Bank, 2012). The initial unexpectedly high return on investment (Etzo & Collender, 2010), fuelled by chronic underinvestment in telecommunications infrastructure (ITU, 2007), pent-up demand (Aker & Mbiti, 2010), rising social mobility (World Bank, 2012), and growing purchasing power sparked an investment race in mobile technology.

This race resulted in fierce competition among mobile phone companies (Williams et al., 2011 p. 37). While early adopters generally saw immediate benefits, these were quickly undermined by capital-rich investors who quickly covered the same geographies, launched aggressive marketing efforts, and offered appealing pricing. The long-term economics of telecommunication operations (Williams et al., 2011 p. 125) provided favorable returns for players who gained significant market share despite initial losses. While pricing was crucial to competitiveness, most operators recognized the need to differentiate themselves in other ways. This resulted in the emergence of value-added services (Garg et al., 2022).

They recognized that the digital technology underpinning mobile communication could accomplish more than just voice services. It served as a platform for the delivery of a wide range of other digital services (known as "non-voice revenue" in mobile telephony). This resulted in numerous new services, many of which were not successful or did not gain sufficient traction to justify their continuation. However, successful initiatives (e.g., SMS, data) often not only achieved adoption (Aker & Mbiti, 2010), but thrived and generated additional revenue streams for operators. Mobile money is one of the value-added services that proved successful for several providers (Garg et al., 2022). While the initial growth of mobile money services in Africa has been impressive, questions remain about their long-term viability. Challenges such as regulatory hurdles, competition, technological advancements, and market saturation pose significant threats to the sustainability and profitability of mobile money providers. The purpose of this review was to analyze existing literature to identify the critical factors that contribute to or hinder the long-term sustainability and profitability of mobile money in Africa (Garg et al., 2022).

What is mobile money?

Mobile money has emerged as a transformative financial technology in Africa over the last 15 years (Suri, 2017). Mobile money involves the creation of a mobile money wallet on a mobile money platform for an individual who meets the Know Your Customer (KYC) requirements defined by the financial regulator. This wallet is independent of a traditional bank account. It contains the customers' value (Suri, 2017). This value can be increased by deposits and receipt of funds from other mobile money users or even from a bank account. However, it remains an independent entity from the traditional bank account. The value can be decreased by withdrawals, merchant payments, sending money to other mobile money subscribers and even sending money to a linked bank account. While all these functions are like typical bank accounts, they are run by much lower margin institutions found in the context of telcos or non-telco mobile money operators.

Figure 1 illustrates different types of mobile money service functions are shown below. Some transactions may be performed administratively by the mobile money operator (provisioning, suspension/unsuspension, pin reset, termination) while the bulk is executed by the customer (cash-in, cash-out, self-provisioning, third-party transactions). Once again, many of the transactions are very similar to what can be done by mobile banking or credit card, but with much lower risk (as wallet balances and transaction amounts are limited), greater flexibility (ease of use, SMS confirmation, USSD interaction), and lower cost.

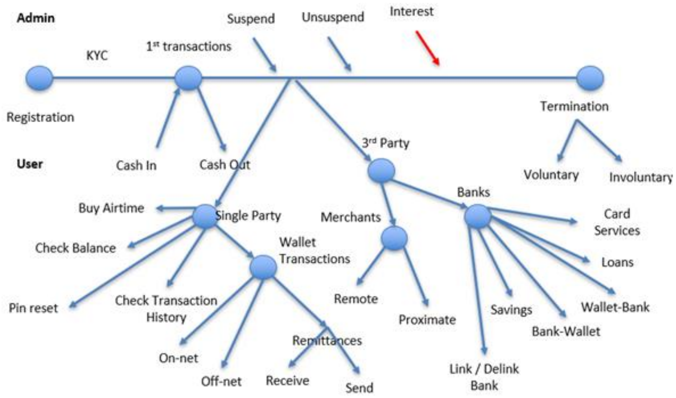

Figure 1: Types of mobile money service functions

The mobile money ecosystem is in a constant of evolution (Raithatha & Storchi, 2024). It is based on a dynamic and loosely regulated set of individuals called agents who are responsible for providing a cash float to the mobile money subscribers for purposes of cash in and cash out. The weaker regulation comes from the fact that individual agents do not hold as much money as a typical bank branch may have, reducing their risk and cost. But what they lack in substance they make up in quantity. Agent ecosystems are critical to lubricating the mobile money ecosystem. Another key player in the ecosystem are the banks. While their initial role in the ecosystem was as a store of the trust fund for the mobile money operators, they looked at the mobile money operators as a threat. But over time they realised that the mobile money operators were serving customers that the banks could not afford, and hence had no interest to service. Hence, in most mature mobile money markets, banks seek to coexist with the mobile money operators by providing facilities to send and receive money to and from bank accounts. This has slightly reduced the reliance on the physical agent network. Merchants also play a key role in the ecosystem offering both remote and proximate payment possibilities. Mobile money largely has supplanted the role of the credit card in this space especially where credit card penetration is low (Raithatha & Storchi, 2024). The growth of merchant transactions has started to attract other merchant-like services such as insurance and microcredit services. Mobile money is more than just a financial service; it is a versatile platform that can support a multitude of financial services. By taking use of the widespread use of mobile phones, it can facilitate not only financial transactions but also serve as a gateway to a variety of other services that improve economic and social activities. One of the most prominent examples of mobile money's potential is its application in microfinance. Mobile money platforms enable the distribution and repayment of microloans, making it easier for small enterprises and entrepreneurs to obtain credit without the use of physical banks (Jack & Suri, 2014). Furthermore, mobile money has enabled the establishment of mobile savings accounts, where users may safely store money and earn interest, thereby boosting financial inclusion and literacy (Demombynes & Thegeya, 2012). Aside from financial services, mobile money systems are being connected with health and agriculture services. Mobile health (mHealth) efforts, for example, use mobile money to simplify payments for health services and insurance, hence boosting healthcare access in distant locations (Ahmed & Cown, 2019). In agriculture, mobile money is used to pay for goods and services, access market information, and even receive crop sales payments, hence increasing production and market efficiency (Aker & Mbiti, 2010).

Furthermore, mobile money platforms have tremendous potential to assist future breakthroughs. As mobile technology advances, we may expect to see new services such as smart contracts, blockchain-based financial services, and even integration with Internet of Things (IoT) devices, which will enable automated and real-time transactions. Mobile money infrastructure's flexibility and agility make it a perfect foundation for developing innovations.

Adoption of Mobile Money

Since the introduction of M-Pesa in Kenya in 2007, the quick uptake of mobile money services in several African countries has been a game changer in the financial sector. Safaricom developed M-Pesa, which let users to deposit, withdraw, and transfer money using their mobile phones, radically changed how Kenyans accessed financial services (Mbiti & Weil, 2011). Its success immediately established a precedent for other mobile network operators and financial service providers throughout Africa, resulting in the broad adoption of similar services. The simplicity, security, and accessibility of mobile money services have contributed significantly to their rapid adoption, providing a practical alternative for millions of unbanked people to participate in the formal financial system (Jack & Suri, 2014).

One of the key drivers of mobile money adoption has been the desire to combat financial exclusion in areas with limited access to traditional banking infrastructure. Many African countries, particularly in rural areas, have few banks that are sometimes unavailable due to lengthy distances and high expenses. Mobile money has successfully overcome this gap by utilizing the broad availability of mobile phones. According to Aker and Mbiti (2010), the widespread use of mobile phones in Sub-Saharan Africa provides an unprecedented potential to provide financial services to neglected communities. This accessibility has not only increased financial inclusion but also encouraged economic activity by allowing for quick and secure transactions, savings, and credit. Mobile money has enabled people to save, invest, and deal with emergencies more successfully by providing a dependable and efficient way to manage their finances.

Furthermore, mobile money adoption has had a tremendous societal impact, notably in terms of women's empowerment and access to basic services. Jack and Suri (2014) found that mobile money also increased women's financial independence, allowing them to handle their own money and participate more actively in economic activities. Mobile money has also made education and healthcare more accessible by making it easier to pay school fees (Tabetando & Matsumoto, 2020) and medical bills (Ahmed & Cown, 2019). Despite these achievements, problems like as legislative constraints, new taxation measures, technological barriers, and the need for more comprehensive financial education persist. Addressing these difficulties through targeted regulations and ongoing research will be critical to the long-term growth and advantages of mobile money services in Africa.

Study Aim:

The purpose of this review was to analyze existing literature to identify the critical factors that contribute to or hinder the long-term sustainability and profitability of mobile money in Africa

Methods:

Theoretical Review on Mobile Money

The literature largely acknowledges the quick expansion and adoption of mobile money services in several African nations since M-Pesa's inception in Kenya in 2007 (Mbiti & Weil, 2011). Various researchers have shown that these platforms have dramatically expanded financial inclusion among previously unbanked communities, altering access to financial services and empowering individuals economically (Suri & Jack, 2016). The following sections discuss studies related to mobile money in the context of Africa and beyond.

Economics Impacts Mobile Money

Research has shown that mobile money services significantly enhance users' economic outcomes and financial practices. Jack and Suri (2014) found that adopting M-Pesa in Kenya brought an estimated 2% of households out of poverty, highlighting its potential for poverty reduction. Additionally, mobile money improves informal risk-sharing networks, providing a crucial financial safety net during economic shocks (Blumenstock et al., 2016). It also encourages saving habits, particularly among women and low-income individuals, by offering convenient and secure accounts that motivate frequent and effective saving (Amoah et al., 2020; Demombynes & Thegeya, 2012). These findings underscore the varied benefits of mobile money services in promoting economic resilience and increasing the financial well-being of communities.

Social Impacts Mobile Money

The literature also investigates the different social consequences of mobile money, emphasizing its potential to generate considerable social change. Gender empowerment is an important area of focus. Several studies have found that mobile money can help women gain more financial independence and control over their finances, perhaps leading to more empowerment (Aker & Mbiti, 2010; Morawczynski, 2009). However, the findings are inconsistent, with some research revealing significant advantages and others demonstrating limited or variable effects depending on the environment. This implies that, while mobile money has the potential to empower women, its success is influenced by a variety of sociocultural and economic factors.

Another significant societal benefit of mobile money is its ability to boost educational outcomes. Researchers investigated how mobile money simplifies the payment of school fees, allowing families to better manage educational expenses (Tabetando & Matsumoto, 2020). This can result in more constant school attendance and possibly higher educational achievements for youngsters. Mobile money can help to remove the financial hurdles that often hinder students from finishing their education, particularly in low-income households, by providing a dependable and accessible way to handle educational payments.

Furthermore, the usage of mobile money for health-related payments has been investigated in various research, showing its potential impact on healthcare accessibility (Ahmed & Cown, 2019). Mobile money can streamline the payment process for medical services and health insurance, making it easier for people to get the care they need. This is especially useful in areas where traditional banking services are limited, as mobile money offers an alternate method of assuring fast and secure transfers for health-related payments. Mobile money can improve healthcare access and overall well-being in underprivileged populations.

Challenges of Mobile Money Services Adoption

Many scholars emphasize the significance of adequate regulation in balancing financial inclusion, consumer protection, and anti-money laundering measures. Effective regulatory frameworks are critical for creating a secure and trustworthy mobile money environment that promotes user adoption while protecting against financial crime. According to Odu (2020), laws must be carefully drafted to encourage innovation and growth in mobile money services while maintaining the integrity of financial systems. Consumer protection and adherence to anti-money laundering requirements are key components in maintaining public trust and preventing the exploitation of mobile money networks.

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The literature on mobile money emphasizes its quick growth and considerable economic and social consequences since M-Pesa's introduction in Kenya. Economically, mobile money services have reduced poverty, strengthened risk-sharing networks, and increased savings, particularly among women and low-income people, altering the financial environment in emerging countries. Socially, mobile money empowers women, enables educational payments, and increases healthcare access, albeit its usefulness varies depending on the environment. Challenges persist, such as the need for effective legislative frameworks, overcoming technology constraints, and reaching market critical mass. Addressing these issues through targeted research and policy actions can boost mobile money's positive effects.

Results:

This section presents the current gaps mobile money literature. It looks at gender disparities, women's empowerment, barriers that limit the usage of mobile money, levels of digital literacy, geographic disparities, regulatory frameworks, innovative use cases and business models and sustainability of mobile money services.

Gender Disparities in Mobile Money Adoption

Raithatha & Storchi (2024) highlight a significant gender disparity in mobile money uptake and usage across most African countries, with Kenya being an exception. Despite the overall rise in mobile money services, women are significantly less likely to possess or use them due to socioeconomic restrictions, traditional gender roles, limited mobility, low digital literacy, and societal norms favouring men's financial activities. Consequently, women's utilization of mobile money services is limited and less diverse even when they have access. Addressing this issue requires extensive research into the sociocultural hurdles that prevent women from fully engaging with mobile money. Strategies to boost digital literacy among women, such as community-based training initiatives, female-focused marketing efforts, and partnerships with local organizations, maybe critical. These efforts can help build trust, raise awareness, and ensure women can use mobile money services to improve their economic status and financial independence.

Impact on Women's Economic Empowerment

Despite the widely accepted potential of mobile money to increase women's economic empowerment, there is a lack of empirical evidence on its long-term impacts. Existing research often focuses on short-term benefits, such as enhanced access to financial services and transaction efficiency, but there is a scarcity of thorough longitudinal studies on how sustained use of mobile money affects women's livelihoods, economic independence, and overall well-being. Understanding these long-term effects is crucial for developing policies and initiatives that maximize the benefits of mobile money for women. More longitudinal studies are needed to evaluate the long-term economic impact of mobile money on women's lives, particularly in terms of business and entrepreneurship, financial management, access to loans, and the ability to save and invest. Identifying the obstacles women face in using mobile money for business can also help develop tailored support programs. Addressing these research gaps will enable policymakers and practitioners to create more effective economic empowerment programs for women and promote gender equality in financial inclusion.

Barriers to the Diverse Usage of Mobile Money

Even when women have access to mobile money accounts, their usage is often limited to basic transactions like person-to-person transfers and airtime top-ups, unlike men who engage in a broader range of activities such as savings, credit, and payments for goods and services (Reynolds et al., 2023). This restricted utilization limits women's ability to fully benefit from the economic and social advantages of mobile money, due to lower digital literacy, societal norms, and limited awareness of available services. To address this gap, more research is needed to develop educational programs and awareness campaigns that promote diverse uses of mobile money among women, focusing on improving their digital literacy and financial understanding. Additionally, identifying and addressing trust issues with mobile financial services is crucial. Research should explore women's risk perceptions and experiences to create tailored interventions that enhance confidence in mobile money services, ensuring they are seen as safe, reliable, and beneficial for women.

Digital Financial Literacy

Low levels of digital and financial literacy among rural populations make it difficult to use mobile money services effectively, limiting their capacity to transact, save, and obtain loans. This divide not only restricts their financial inclusion but also prevents them from fully utilizing the economic benefits of mobile money services. The discrepancy in digital and financial literacy between urban and rural communities exacerbates existing disparities and slows overall progress toward financial inclusion. To address this gap, more research is needed to create and evaluate effective digital and financial literacy (DFL) programs tailored to various demographic groups. These programs should consider the unique constraints rural communities face, such as limited access to technology and educational resources. Integrating DFL into the larger educational system, including school curricula and adult education programs, is also critical. This comprehensive approach can enhance financial inclusion and economic empowerment in rural communities.

Geographic Disparities in Mobile Adoption

Mobile money adoption rates vary across Africa, with Sub-Saharan Africa showing significantly greater adoption than North Africa and other regions (Raithatha & Storchi, 2024). This disparity highlights the uneven development and availability of mobile money services, driven by factors such as favorable legal frameworks, substantial mobile phone coverage, and a strong need for financial inclusion in Sub-Saharan Africa. In contrast, North Africa has seen slower growth due to less favorable legislative regimes and different socioeconomic conditions. To address this gap, further research through comparative studies is needed to identify best practices from high-adoption areas that can be applied to regions with lower adoption rates. These studies should explore geographical differences in regulatory regimes, socioeconomic factors, and technological infrastructure. By evaluating successful strategies and adapting them to the unique challenges of lower-adoption regions, policymakers and stakeholders can develop more effective interventions to boost mobile money adoption and utilization across the continent.

Mobile Money Regulatory Frameworks and their Impact

The importance of regulatory frameworks in the adoption and use of mobile money services varies greatly between nations. Favourable regulations in some areas have spurred the rapid rise and widespread use of mobile money, enhancing financial inclusion and economic participation. Conversely, restrictive or ambiguous regulatory regimes in other countries have hindered the development and use of these services (Katusiime, 2021). This variation underscores the crucial role of national policies and regulatory measures in the success of mobile money initiatives and the need for tailored regulatory approaches that consider local contexts and market conditions. More research is needed to assess the impact of different regulatory methods on mobile money adoption and usage. Comparative studies can help identify the most effective regulatory frameworks (Asongu et al., 2020). Additionally, policy recommendations should prioritize innovation, consumer safety, and interoperability across mobile money systems. Understanding the regulatory factors that drive or impede adoption will enable stakeholders to develop more informed and effective policies to promote the global expansion of mobile money services.

Innovative uses and Business Models in Mobile Money Transactions

While basic mobile money transactions like person-to-person transfers and airtime top-ups have been extensively researched, there is less understanding of the impact and potential of newer use cases such as foreign remittances, merchant payments, and microinsurance. These advanced services hold substantial promise for increasing financial inclusion and spurring economic growth but remain underexplored. Expanding mobile money into these areas could provide crucial financial services to disadvantaged populations, enhance international trade, and offer safety nets through microinsurance, though the methods and effects are not well understood. Further research is needed to explore innovative business models and their success in various contexts, particularly for these new use cases. Studies should examine how foreign remittances, merchant payments, and microinsurance can be integrated into existing mobile money frameworks and what strategies can ensure their long-term viability and scalability. Additionally, it is crucial to assess the impact of these emerging use cases on economic development and financial inclusion, providing valuable insights for policymakers and financial service providers to optimize the benefits of mobile money technologies.

Sustainability and Profitability of Mobile Money Services

There is a considerable lack of empirical studies on the long-term viability and profitability of mobile money services, particularly in competitive markets. While the initial acceptance and short-term benefits of mobile money are well-documented, little is known about how these services can sustain growth and profitability over time. This gap is concerning as market saturation and rising competition force providers to innovate and diversify. Without thorough evaluations of sustainability and profitability, providers may struggle to develop effective long-term strategies. Further research is needed to identify business solutions that can secure the long-term viability and profitability of mobile money services. This includes exploring the role of strategic partnerships with banks, fintech companies, and other stakeholders, as well as leveraging technological advancements to improve service delivery, enhance customer experience, and reduce operating costs. Understanding and applying these strategies will help mobile money providers navigate competitive markets and continue to promote financial inclusion and economic development

Discussion:

Identifying research gaps in mobile money services is critical for several reasons. Bridging these gaps provides a deeper understanding of the mobile money ecosystem's challenges and opportunities, enabling the creation of tailored interventions that address the unique needs of various demographic groups and regions. Understanding the constraints that limit widespread acceptance and usage allows stakeholders to develop inclusive policies ensuring the benefits of mobile money are accessible to all. Additionally, addressing these gaps can help build a robust and resilient mobile money infrastructure capable of adapting to changing market dynamics and technological advancements.

Closing these research gaps could significantly impact financial inclusion and economic development. Mobile money services can integrate millions of unbanked and underbanked individuals into the formal financial system, providing them with essential tools and resources to improve their economic situation. Increased financial inclusion can lead to higher savings, easier access to credit, and greater investment in local businesses, contributing to economic growth. Moreover, mobile money can facilitate efficient and secure international remittances, merchant payments, and microinsurance, positively affecting poverty reduction and social welfare. Addressing these knowledge gaps is essential for developing effective regulatory frameworks and business strategies, and guiding policymakers and financial service providers to create a more inclusive and dynamic financial ecosystem that supports sustainable economic development and enhances livelihoods across diverse regions.

Conclusion

Despite substantial advances in mobile money services, several research gaps require immediate attention. Key issues include gender disparities in mobile money uptake and usage, lower levels of digital and financial literacy among rural communities, and a lack of understanding of the long-term sustainability and profitability of these services in competitive markets. Additionally, more information is needed about the impact and potential of emerging mobile money use cases such as remittances, merchant payments, and microinsurance. The role of regulatory frameworks in different countries and variations in adoption rates across African regions further illustrate the complexities of the mobile money landscape, highlighting the need for more focused research.

To close these gaps, researchers must prioritize studies that address these critical issues. Longitudinal studies measuring the long-term economic impact of mobile money, especially on women's economic empowerment, are essential. Comparative studies can offer valuable insights into best practices from regions with high adoption rates and highlight differences in regulatory regimes and socioeconomic conditions. Further research into business strategies for maintaining sustainability and profitability, along with the role of strategic partnerships and technological advancements, is also needed. Collaboration among stakeholders, including governments, financial institutions, telecom operators, and academic researchers, is crucial to advance this research agenda. By working together, these stakeholders can develop more effective policies and initiatives to promote financial inclusion and economic development, ultimately fostering a more inclusive and dynamic financial environment in Africa.

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Competing Interests

The author declares that there are no conflicts of interest related to this study.

Reference

Ahmed, H., & Cown, B. W. (2019). Mobile Money and Healthcare use—Evidence from East Africa. *NBER Working Paper No. 25669*, *JEL No. I13,I15,O55*.

Aker, J. C., & Mbiti, I. M. (2010). Mobile Phones and Economic Development in Africa. *Journal of Economic Perspectives*, *24*(3), 207–232. https://doi.org/10.1257/jep.24.3.207

Amoah, A., Korle, K., & Asiama, R. K. (2020). Mobile money as a financial inclusion instrument: What are the determinants? *International Journal of Social Economics*, *47*(10), 1283–1297. https://doi.org/10.1108/IJSE-05-2020-0271

Asongu, S. A., Biekpe, N., & Cassimon, D. (2020). Understanding the greater diffusion of mobile money innovations in Africa. *Telecommunications Policy*, *44*(8), 102000. https://doi.org/10.1016/j.telpol.2020.102000

Blumenstock, J. E., Eagle, N., & Fafchamps, M. (2016). Airtime transfers and mobile communications: Evidence in the aftermath of natural disasters. *Journal of Development Economics*, *120*, 157–181. https://doi.org/10.1016/j.jdeveco.2016.01.003

Demombynes, G., & Thegeya, A. (2012). *Kenya's Mobile Revolution and the Promise of Mobile Savings*. The World Bank. https://doi.org/10.1596/1813-9450-5988

Etzo, S., & Collender, G. (2010). The mobile phone 'revolution' in Africa: Rhetoric or reality? *African Affairs*, *109*(437), 659–668. https://doi.org/10.1093/afraf/adq045

Garg, A., Gupta, S., Mathew, M., & Singh, S. (2022). Prioritising the preference of factors affecting the mobile network selection: A combination of factor analysis and best worst method. *Journal of Public Affairs*, *22*(1), e2345. https://doi.org/10.1002/pa.2345

ITU. (2007). *Telecommunication/ICT markets and trends in Africa, 2007*.

Jack, W., & Suri, T. (2014). Risk Sharing and Transactions Costs: Evidence from Kenya's Mobile Money Revolution. *American Economic Review*, *104*(1), 183–223. https://doi.org/10.1257/aer.104.1.183

Katusiime, L. (2021). Mobile Money Use: The Impact of Macroeconomic Policy and Regulation. *Economies*, *9*(2), 51. https://doi.org/10.3390/economies9020051

Kimwise, A. (2017). Adoption of E-Learning Technologies in Educational Institutions/Organizations: A Literature Review. Asian Journal of Educational Research 5 (4), 2311-6080

Mbiti, I., & Weil, D. (2011). *Mobile Banking: The Impact of M-Pesa in Kenya* (w17129; p. w17129). National Bureau of Economic Research. https://doi.org/10.3386/w17129

Morawczynski, O. (2009). Exploring the usage and impact of "transformational" mobile financial services: The case of M-PESA in Kenya. *Journal of Eastern African Studies*, *3*(3), 509–525. https://doi.org/10.1080/17531050903273768

Odu, D. N. (2020). *Impact of AML/CFT regulations on digital disruptions (FinTech) and financial inclusion in Sub-Saharan Africa. 44*.

Raithatha, R., & Storchi, G. (2024). *State of the Industry Report on Mobile Money*. GSMA.

Reynolds, T. W., Biscaye, P. E., Anderson, C. L., O'Brien, C., & Keel, J. (2023). Exploring the gender gap in mobile money awareness and use: Evidence from eight low and middle incom. *INFORMATION TECHNOLOGY FOR DEVELOPMENT*.

Suri, T. (2017). Mobile Money. *Annual Review of Economics*, *9*(1), 497–520.

Suri, T., & Jack, W. (2016). The long-run poverty and gender impacts of mobile money. *Science*, *354*(6317), 1288–1292. https://doi.org/10.1126/science.aah5309

Tabetando, R., & Matsumoto, T. (2020). Mobile money, risk sharing, and educational investment: Panel evidence from rural Uganda. *Review of Development Economics*, *24*(1), 84–105. https://doi.org/10.1111/rode.12644

Williams, M. D. J., Mayer, R., & Minges, M. (2011). *Africa's ICT Infrastructure*. The World Bank. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/375261468204545149/africas-ict-infrastructure-building-on-the-mobile-revolution

World Bank. (2012). *Information and Communications for Development 2012: Maximizing Mobile*. The World Bank. https://doi.org/10.1596/978-0-8213-8991-1