Mobile Money and the Likelihood of Female Entrepreneurship in Sub-Saharan Africa

Diamond Abiakalam Chinagorom

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Abstract

Female entrepreneurship is crucial for development, as it empowers women and strengthens their communities. However, many women face barriers like limited access to formal financial services and the burden of household responsibilities, which can restrict their ability to start or sustain businesses. This thesis examines the impact of mobile money use on women's decision to become entrepreneurs in 13 Sub-Saharan African countries, using data from the FinScope Consumer and FinAccess surveys. Findings suggest that mobile money use increases the likelihood of women becoming entrepreneurs by 1.2 percentage points, controlling for other factors. A closer look at Nigeria and Kenya reveals that while mobile money use has a negative and insignificant effect on the likelihood of entrepreneurship for men in Nigeria, the effect is positive and significant for Kenyan men. In both countries, female mobile money users are more likely to pursue entrepreneurship than their male peers. This research contributes to understanding the role of mobile money in promoting female entrepreneurship and emphasizes the importance of country-specific contexts in shaping effective digital financial inclusion policies.

Mobile Money and the Likelihood of Female Entrepreneurship in Sub-Saharan Africa

By Diamond Abiakalam Chinagorom

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1 Introduction

" Our mission to end poverty and increase prosperity can't be accomplished unless we tap the full potential of women entrepreneurs." These words, spoken by then World Bank President Jim Yong Kim at the 2016 launch of the Women Entrepreneurs Finance Initiative (We-Fi), reflect a growing global recognition of the role women play in economic development. Female entrepreneurship is especially important in Sub-Saharan Africa, where women account for 58% and 26% of women engage in entrepreneurship (Dushime 2022). In 2016, the total value created by female entrepreneurs in Africa was estimated between $250 and $300 billion, roughly 13% of the continent's GDP (Berger 2018). This highlights the significance of female entrepreneurs in Africa's economic growth.

Despite their economic significance, many female-owned businesses in the region continue to struggle due to limited access to formal financial services, particularly access to credit (Asiedu et al. 2013; Bardasi, Blackden, and Guzman 2007). Credit is essential for starting and growing a business. In addition, household dynamics may pressure women to transfer resources to male relatives and take on a disproportionate share of domestic responsibilities (Gbandi, Korem, and Zinsou-Klassou 2023). These barriers limit women's potential to pursue entrepreneurship.

Over the past two decades, mobile money has transformed Sub-Saharan Africa's financial landscape. Since its inception in 2007, mobile money has allowed individuals to access financial services directly through their mobile phones. Research has investigated the role of mobile money in promoting financial inclusion. For many women, access to a mobile money account can be their first step towards participation in formal financial markets since they have historically been excluded from formal financial services (Abebe et al. 2017). Literature has also explored how mobile money enables consumption smoothing for households and individuals, and how mobile money benefits entrepreneurs by providing access to credit, streamlining payments, and reducing risk (Jack and Suri 2014). However, there is limited

research on how mobile money influences people's entrepreneurial decisions. This thesis seeks to fill that gap: does access to mobile money encourage women to become entrepreneurs in Sub-Saharan Africa?

This research question is important because it lies at the intersection of two important forces shaping development in Sub-Saharan Africa: female entrepreneurship and mobile money. If mobile money reduces friction in accessing capital and managing income, it may not only support existing female entrepreneurs but also encourage more women to pursue entrepreneurship in the first place. Understanding this relationship is crucial for governments who are working to build inclusive economic systems that empower women and support growth. This thesis investigates how mobile money adoption influences a woman's choice to become an entrepreneur in Sub-Saharan Africa. I argue that mobile money improves women's access to capital and helps them manage household pressure by allowing greater discretion over their income.

I use nationally representative data from FinScope Consumer Surveys and FinAccess Surveys to investigate this relationship. To estimate the effect of mobile money usage on entrepreneurship, I employ a linear probability model with relevant controls. Initial estimates from the linear probability model suggest a negative relationship between mobile money use and the likelihood of entrepreneurship among men. However, when controlling for area and year fixed effects, the relationship becomes positive and significant. Across all specifications, the additional effect of mobile money use on the likelihood of a woman becoming an entrepreneur remains positive and significant. Specifically, the additional effect of mobile money for women compared to men on the likelihood of become an entrepreneur when all other variables are controlled is 1.2 percentage points.

I explore this relationship in depth in two countries: Nigeria and Kenya. In Nigeria, mobile money adoption rates remain low, and this pattern cannot be fully explained by the two main factors I associate with adoption: mobile phone access and bank account penetration. Mobile phone ownership in Nigeria is comparable to that of countries with

much higher mobile money usage, and bank account penetration is similarly aligned. This suggests that traditional banking services are not simply substituting mobile money. I include Kenya as a point of comparison because it is widely regarded as a leading example of mobile money uptake in Sub-Saharan Africa. Mobile money use is associated with an insignificant and negative likelihood in becoming an entrepreneur for Nigerian men when all other factors are controlled. However, women who use mobile money are 2.7 percentage points more likely to become entrepreneurs than male users in Nigeria. Different results were found in Kenya where mobile money usage was positively and significantly associated with the likelihood of entrepreneurship for men across all specifications. When I controlled for all other factors, women were 2.5 percentage points more likely to become entrepreneurs compared to men. In both countries, the marginal benefit of mobile money use for women is similar. However, my heterogeneous effects analysis suggests that the mechanisms behind this are different for these two countries.

One existing study by Kedir and Kouame (2022) examines the effect of mobile money on women's entrepreneurial choices in Burkina Faso and Cameroon. They use FinScope Consumer Survey data and a probit model to measure this effect. They find that in both countries, mobile money use is strongly associated with a higher likelihood of entrepreneurship for both men and women. They also observe that mobile money use is higher among men but among women, mobile money is more widely used than traditional banks and other formal financial services across countries. Another study examines the effect of mobile money on asset investment among female-owned businesses in Sub-Saharan Africa. Using World Bank Enterprise Survey data from 16 Sub-Saharan African countries, Islam and Muzi (2021) apply both linear probability and probit models. They find that female-owned businesses that use mobile money are more likely to invest in assets compared to male-owned businesses. Mobile money use is also associated with greater provision of customer credit and increased demand for credit for female enterprises. Building on these works, my study contributes to the relatively limited literature on the relationship between mobile money and female

entrepreneurship in Africa.

The structure of this paper is as follows. Chapter 2 reviews existing literature on female entrepreneurship and financial technology in Africa. Chapter 3 describes the dataset and presents descriptive statistics. Chapter 4 outlines the identification strategy and discusses the results, with a particular emphasis on the mechanisms through which mobile money may influence women's entrepreneurship. This chapter also compares Nigeria and Kenya to explore how differing contexts shape the impact of mobile money on women's entrepreneurship choices. Chapter 5 concludes.

2 Literature Review

This section of the paper examines previous research to make the argument that credit constraints and unequal distribution of household resources and responsibilities are key barriers to women's entrepreneurship. It highlights that mobile money can help women overcome these challenges by improving their access to credit through mobile phones and allowing them to manage their income more independently. It has been partitioned into three thematic areas: (i) women and entrepreneurship (ii) financial technology (iii) entrepreneurship and mobile money. The women and entrepreneurship section highlights the importance of female entrepreneurs, their challenges, and the interventions designed to address these challenges. The financial technology section provides background on the financial systems of developing countries and explains how mobile money is a bridge that connects more people to formal financial services. The entrepreneurship and mobile money section examines the role mobile money plays in entrepreneurship, with a particular focus on its impact on female entrepreneurship. Each of these themes provides a foundation for understanding how mobile money shapes women's entrepreneurial behavior in Sub-Saharan Africa.

Microloans and cash transfers are two of the most commonly used interventions aimed at addressing women's limited access to credit and the burden of household responsibili-

ties. Although some studies point to their effectiveness, these interventions have limitations, such as diversion to spouses, which can hinder the growth and performance of female-owned businesses. As a result, researchers have explored mobile money as a potential solution for female entrepreneurs. Mobile money has been shown to enhance entrepreneurs' access to credit through formal financial services, reduce transaction costs, improve savings, and simplify the process of receiving remittances. However, these benefits do not always translate into increased sales or profits. Furthermore, mobile money is still predominantly used by people who are more educated, live in urban areas, and have bank accounts. Despite these challenges, the literature suggests that mobile money holds considerable potential for supporting entrepreneurship, especially in overcoming gender-specific barriers to business formation and growth.

2.1 Women and Entrepreneurship

This segment highlights the importance of female entrepreneurs in economies, the obstacles they face, and the interventions designed to address these barriers. It lays the foundation for understanding how mobile money may address these challenges more effectively than previous efforts. The participation of women in entrepreneurial activities is crucial because it empowers women and creates positive ripple effects in their families and local communities (Duflo 2012; Doepke and Tertilt 2014). Female entrepreneurship can increase women's labor force participation by creating more employment opportunities for other women (Chiplunkar and Goldberg 2021). When women engage in the labor market and earn more income, they tend to allocate a larger share toward their children's welfare and invest more in human capital than men (Doepke and Tertilt 2014). Additionally, digital finance has enhanced the household bargaining power of women by encouraging entrepreneurial activities and increasing their participation in financial markets (Han, Zhang, and Zhu 2023). However, several obstacles hinder the performance of female entrepreneurs and limit their potential to drive economic growth.

2.1.a Access to Credit

Access to credit is a persistent challenge to female entrepreneurship. Literature shows that this challenge is often more severe for women, as they typically lack collateral and are concentrated in less profitable sectors. Asiedu (2013) analyzes firm-level data from non-agricultural businesses with at least five employees across 90 countries and finds that a gender gap persists in entrepreneurs' access to credit in Sub-Saharan Africa. Ackah et al. (2023) investigate how funding affects the performance of male and female-owned businesses in Ghana. They find that women facing severe financial constraints perform worse than men. However, among those who are not financially constrained, female entrepreneurs show higher productivity than their male counterparts. Access to finance does not appear to be a problem for male entrepreneurs.

There are various reasons why women face discrimination in the credit market. Diaz-Serranno (2022) attributes this discrimination to their lack of collateral. Furthermore, Muravyev et al. (2009) show that the gender gap in accessing credit is correlated with the financial development of a country. Female entrepreneurs were more likely to receive bank loans in financially developed countries, where the required collateral was lower than in financially developing countries. Goldstein et al. (2019) investigate the sectoral segregation of female and male-owned businesses and they find that sectors dominated by female-owned businesses tend to be less profitable. Businesses that operate in a less profitable sector are less likely to secure the external finance they require to grow. Other factors such as cultural barriers, low educational levels, and earning power play a role in women's access to credit (Graney and Perlik 2024).

However, some literature on female entrepreneurship argues that the challenges female-owned businesses face are not a result of gender-based discrimination (Aterido, Beck, and Iacovone 2011; Bardasi, Sabarwal, and Terrell 2011; Hansen and Rand 2013). In their study, Arterido et al. (2011) highlight that female entrepreneurs face greater challenges accessing credits not because of issues within the financial sector, but due to their limited participation

in the market economy. Bardasi et. al (2011), and Hansen and Rand (2013) assert that women are as likely or more likely to receive credit from banks as their male counterparts in Sub-Saharan Africa.[1] Therefore, no gender-specific barrier exists in their access to credit.

2.1.b Household Dynamics

When women have more household responsibilities or live with male relatives, they often have less time and fewer resources to invest in their businesses, which negatively affects their business performance. Hundley (2000) highlights that the earnings of self-employed women decline with marriage, family size, and hours spent on housework, whereas the earnings of self-employed men increase with these factors. Fortin (2005) finds that in OECD countries, the perception of women's role as homemakers at the country level affects the outcomes of women in the labor market. If female entrepreneurs perceive homemaking as their main responsibility, it can influence how they prioritize their businesses, the effort they invest, and ultimately, their business performance. Fang (2022) studies the potential factors that affect the productivity of women-led and male-led firms. Their results show that women-led firms face greater disadvantages in regions with more pronounced gender inequalities and heavier household responsibilities placed on women. In Togo, Gbandi et al. (2023) examine the gender difference in the performance of micro-commerce firms and reveal that household responsibilities affect the performance of women-owned micro-commerce firms because women often have a greater share of domestic work, leaving them with less time to focus on their business.

However, family can also act as support systems for female entrepreneurs. They can

1. Bardasi et al. (2011) investigate the performance of male and female enterprises in Europe and Central Asia, Latin America, and Sub-Saharan Africa. Their results show that in Latin America and Sub-Saharan Africa, banks are equally likely to lend to female entrepreneurs as they are to male entrepreneurs. They find that different motivations and preferences, compared to their male counterparts, explain the observed gap in entrepreneurial performance for female entrepreneurs in these regions.

Hansen and Rand (2013) examine credit constraints between male and female-owned enterprises in the manufacturing industry across 16 Sub-Saharan African countries. Their findings suggest that female entrepreneurs experience more favorable treatment when it comes to receiving credit, with women's self-selection into entrepreneurship in this industry being a possible explanation.

share their knowledge, skills, networks, and capital, which are essential to the success of these enterprises. Powell and Eddleston (2013) find that female entrepreneurs benefit more from family support and emotional encouragement for their businesses, while men do not.[2] Research on the impact of household support on the performance of female entrepreneurs in developing countries remains limited. This highlights a need for further exploration in this area.

2.1.2 Interventions

Various interventions like have been implemented to address the challenges that affect the performance of female entrepreneurs in Sub-Saharan Africa, with a particular focus on overcoming limited access to credit. The most common approaches, microloans and cash transfers, are still limited in their effectiveness in addressing this barrier. In a randomized study, Banerjee et al. (2015) examine the effects of a group-lending microcredit program in India. They observe a significant rise in the number of businesses run by women, but the impact on women's empowerment remains minimal and statistically insignificant.[3] Bernhardt et al. (2019) investigate the effect of extending microloans on the profit of female-owned enterprises at the household level in India, Sri Lanka, and Ghana. Their findings suggest that the returns to capital are low primarily because these microloans are often invested in the businesses of the entrepreneurs' spouses. Similar to Bernhardt et al. (2019), Goetz and Gupta (1996) highlight that a significant proportion of microloans given to women in Bangladesh are controlled by male relatives. Kevane and Wydick (2001) examine whether a tradeoff exists between economic growth and child welfare in Guatemala. They find that female entrepreneurs in their childbearing years face greater limitations in generating employment within their businesses compared to both male entrepreneurs and female entrepreneurs beyond their childbearing

2. Powell and Eddleston (2013) required respondents to indicate on a 7-point scale (1 = strongly disagree, 7 = strongly agree) to four statments related to family support. The statements were averaged to yield an effective enrichment score.

3. Banerjee et al. (2015) measure women's empowerment using an equally weighted average of z-scores across 16 social indicators on women making decisions on matters such as food, clothing, health, and education expenses.

years. Interestingly, the income of female entrepreneurs in childbearing years has the most significant positive impact on child welfare. In contrast, older women are more aggressive in creating jobs and demonstrate a level of employment generation similar to that of men.

Fiala (2018) investigates the effect of four interventions: cash grants, loans, cash grants with business training, and loans with business training on male and female entrepreneurs in Uganda. Cash grants differ from microloans in that they do not require repayment. The results from the study highlight that none of the interventions had significant effects on the business profits for female entrepreneurs. On the other hand, male entrepreneurs who received loans experienced a significant increase in their business profit. During qualitative interviews, the women in this study reported using cash grants for household expenses. Fafchamps et al. (2011) examine whether capital alone can stimulate the growth of female-owned microenterprises in Ghana by randomly assigning cash and in-kind grants to both women- and men-owned businesses. They observe that women with low initial profits who received cash grants were more likely to increase household expenditures and make transfers to non-household members. In contrast, in-kind grants had a greater impact on business profits, as they were primarily invested back into the business. However, this effect was strongest for female-owned enterprises that were initially more profitable. For men, in-kind grants also led to significant increases in business profits, whereas the impact of cash grants was less consistent. In northern Kenya, Gobin et al. (2017) evaluate the short-and-medium run impacts of the Rural Entrepreneur Access Program (REAP). REAP provides female entrepreneurs with cash transfers, business skills training, business mentoring, and training on savings. The results of their evaluation show that the income of participants increased six months and one year after the program. Cash transfers are more effective when they are paired with mentoring and training.

Although microloans and cash transfers have provided some financial relief to female entrepreneurs, they often do not create sustainable long-term financial benefits. They are frequently diverted to household expenses or given to a spouse or male relative. In addition,

cash transfers are expensive and they do not always translate to lasting business growth. These challenges suggest a need for more flexible and scalable financial solutions for female entrepreneurs. Mobile money has the potential to give women more autonomy over the capital they receive by giving them privacy and the ability to conceal it from their household (Steinert et al. 2022).

2.2 Financial Technology

2.2.1 Formal and Informal Finance

Financial development is essential for entrepreneurship to thrive, as it provides the necessary capital for entrepreneurs, especially female entrepreneurs with more limited access to credit, to start and expand their businesses. The development of financial systems in the developing world has been a topic of significant interest, with much attention being paid to how to increase people's participation in the formal financial sector (Stein and Walter 2013; Callier et al. 1991). King and Levine (1993) revealed the positive relationship between financial development and economic growth.[4] Since then, numerous studies have examined the impact of financial development on both economic growth and individual well-being. In a study involving 25 African countries, Bekele and Degu (2021) investigate the effect of financial sector development on economic growth in terms of depth, measured by credit given to the private sector as a share of the country's GDP, as well as access and efficiency. They find that financial development has a statistically significant effect on the economic growth of the respective countries. Guiso et al. (Guiso, Sapienza, and Zingales 2004) examine how financial development in different local areas affects the economy, even within a connected financial market.[5] Their results indicate that better local financial development makes it more likely for individuals to start businesses, encourages new firms to enter the market,

4. King and Levine (1993) use four financial indicators to examine the link between finance and growth: (1) financial depth (liquid liabilities to GDP), (2) bank versus central bank assets, (3) credit to the private sector as a share of total credit, and (4) credit to the private sector relative to GDP.

5. Guiso et al. (2004) assess financial development by estimating the regional effect on the likelihood that, ceteris paribus, a household is excluded from the credit market.

increases competition, and supports economic growth.

However, structural barriers prevent developing countries from fully advancing their financial systems and this has resulted in the exclusion of many, including women, from the formal financial sector. The formal financial sector is government-regulated and operates under a legal framework (Aryeetey et al. 1997). Examples of formal finance institutions are commercial banks and credit unions. The exclusion from formal financial services has given rise to an informal financial sector that functions independently from government regulations. Informal finance relies on the relationship between the borrower and the lender and the reputation of the borrower (Ayyagari, Demirgüç-Kunt, and Maksimovic 2008). Examples of these informal finance institutions are money lenders and Rotating Savings and Credit Associations (ROSCAs). Microloan interventions are formal finance because they are provided by registered microfinance institutions. Cash transfers can be given through formal or informal channels but mostly through formal channels.

Although informal financial institutions have helped bridge the gap created by underdeveloped financial systems, their limitations, such as being resource-constrained, prevent them from being full substitutes for formal financial institutions (Madestam 2014). Considering this, there has been an increasing interest in interventions such as mobile money that can shift people's reliance on informal financial institutions to formal financial institutions (Ofoeda, Mawutor, and Ohenebeng 2023; Tinta, Ouédraogo, and Al-Hassan 2022).

2.2.2 The Evolution of Mobile Money

Traditional bank branches often require individuals to travel long distances to access basic financial services because they are not evenly distributed across communities. Fortunately, technological advancements have led to the development of financial technology, popularly referred to as fintechs. It has enabled individuals to access financial services digitally rather than relying solely on traditional banking. A fintech can be defined as a company that depends on technology and cloud services to provide financial services to its customers (McK-

insey and Company 2024). Fintechs are classified under formal finance because they are registered and require a banking license from the government to operate. The developing world has witnessed rapid growth in fintech with the sector expanding at an unprecedented pace. In Sub-Saharan Africa, nearly half of the 5,200 tech startups that emerged between 2020 and 2021 were fintech companies (McKinsey and Company 2022). These fintechs, which are formal financial institutions, offer a wide range of services ranging from digital payments, lending, cross-border remittances, insurance, and investment opportunities.

One of the most popular types of fintech in developing countries is mobile money. Mobile money enables users to store, send, and receive funds using their mobile phones. Mobile money first emerged in Kenya as M-PESA when it was launched by Safaricom in 2007 (McCaffrey 2022). Mobile money is available in nearly 100 countries worldwide, with Sub-Saharan Africa leading in its adoption and usage. By 2023, there were over 1.7 billion registered mobile money accounts (GSMA 2024). In Sub-Saharan Africa, Kenya leads with the most mobile money usage with 96% of all households having more than one individual who uses mobile money (Suri and Jack 2016).

Research has been emerging on the effects of fintech on financial inclusion (Senou and Houensou 2024; Ashenafi and Yan 2023; Simione and Muehlschlegel 2023; Khera et al. 2021). Senou and Houensou (2024) examine how mobile money, a type of fintech, helps reduce poverty by promoting financial inclusion in West African Monetary Union (WAEMU) countries. They find that individuals who use mobile money regularly are 17.8% more likely to escape poverty because it enables them to borrow and receive remittances more easily. However, no causality can be established because they use data from the Global Financial Development surveys provided by the World Bank. Mbiti and Weil (2011) study the economic impacts of M-Pesa, Kenya's leading mobile money service. They calculate causal estimates of its effects using survey and administrative data. Their findings indicate that M-Pesa increases the frequency of money transfers, reduces reliance on informal saving mechanisms like ROSCAs, and enhances the likelihood of having a bank account. Heath and Riley

(2024) examine the impact of women in microfinance groups switching to mobile money for weekly loan repayments on their empowerment in Tanzania. Their findings indicate that women's use of other mobile money services increased, along with their control over finances and household decision-making. Additionally, household expenditures became more aligned with women's preferences.

Economists have also explored the impact of mobile money on household welfare (Suri, Bharadwaj, and Jack 2021; Jack and Suri 2014). Suri et al. (2021) evaluate the takeup and impact of M-Shwari, a mobile money loan program, in Kenya. They show that M-Shwari helps households mitigate shocks by expanding their access to credit. In another study, Jack and Suri (2014) examine the impact of mobile money on household consumption. They find that M-PESA users can mitigate shocks through remittances, as mobile money's low transaction costs enable households to share risks more efficiently. Households without mobile money see a 7% decline in consumption during negative shocks, whereas M-PESA users experience no change in their consumption. Munyegera and Matsumoto (2016) evaluate the impact of mobile money on household welfare in Uganda. They find that households using mobile money see a significant rise in per capita consumption and receive remittances more frequently and in higher amounts compared to non-users.

Mobile money promotes financial inclusion by expanding access to credit, helping individuals manage financial shocks, reducing payment frictions for smoother and more efficient transactions, and simplifying the process of receiving remittances from domestic sources.

However, the presence of mobile money in a country does not always imply widespread adoption of its services, especially among groups historically marginalized from traditional financial systems. If mobile money accounts are not utilized by those who need them most, their potential to enhance financial inclusion in Sub-Saharan Africa remains limited. Fall et al. (2020) find that mobile money adoption is driven by educational level, having a bank or MFI account, the proportion of people who have mobile money in the household, and

access to information on mobile money.[6] Factors such as gender, age, owning a bank or MFI account, and participation in a tontine influence mobile money use. They also find that women are less likely to adopt mobile money but are more likely to use it than men.

2.3 Entrepreneurship and Mobile Money

Mobile money encourages entrepreneurship through two main mechanisms. It improves access to credit and reduces the costs and risks associated with long-distance transactions. Access to credit, in particular, is especially important for women. In Malawi, Aggarwal et al. (2020) examine how access to mobile money affects microentrepreneurs. Participants in the treatment group received assistance with account registration, basic training on mobile money usage, and encouragement to save using their accounts. Additionally, withdrawal fees were waived for this group. They observe that rather than using mobile money primarily to reduce the cost of interpersonal transfers, participants mainly used their accounts as a savings tool. Dalton et al. (2022) explore the impact of Lipa Na M-Pesa (LPN), an e-payment system operated by Safaricom, on business finance in Kenya. To encourage its adoption, the treatment group was provided with a comparison of the advantages and disadvantages of LPN relative to other payment methods. Their study shows that LPN increases the likelihood of a business accessing mobile loans and reduces sales volatility for small businesses. However, they observe no significant effect on sales or profits.

Islam and Muzi (2021) specifically explore the effect of mobile money on female entrepreneurship in Sub-Saharan Africa. The results from this study show that there is a positive and statistically significant relationship between mobile money use and the likelihood of investing in assets for female-owned firms but this is not the same for male-owned firms. Riley (2024) examines whether changing the form of disbursement of a microfinance loan enables female microfinance borrowers to overcome intrahousehold sharing pressure and grow their businesses in Uganda. She observes that women who received their micro-

6. Adoption was defined as having opened a mobile money account. The authors use the term mobile banking, which refers to the same concept as mobile money in this thesis.

finance loan on a digital account had 11% higher business capital and 15% higher profits compared to those who received their microfinance loan in cash. In Tanzania, Bastian et al. (2023) investigate the short-term effects of a mobile money savings account, with and without accompanying business training, on female entrepreneurs. Their results, six months post-intervention, indicate that the savings account led to increased savings and transaction activity, with these effects further enhanced by the business training. The women using the platform were able to secure more microloans, and those who participated in the training saw improvements in their business practices. Although there was no significant increase in investment, sales, or profits, the study did find evidence of business expansion and greater empowerment among women.

Kedir and Kouame (2022) examine whether mobile money increases the likelihood of self-employment or entrepreneurship in the Global South, especially for women. Their study focuses on Burkina Faso and Cameroon. The authors use a probit model, with the key outcome being whether an individual is engaged in entrepreneurship which is a binary variable. In both countries, mobile money usage is strongly associated with a higher likelihood of entrepreneurship for both men and women. They also explore the impact of age on entrepreneurship and find that being young is positively associated with a greater likelihood of starting a business. Their findings show that mobile money usage is higher among men. They associate this with fewer women owning mobile phones due to economic constraints, geographic factors, and higher illiteracy rates. However, among women, mobile money is more widely used than traditional banking and other formal financial services in both countries.

While existing literature indicates that mobile money supports entrepreneurship, particularly among women, in developing countries, it may still exclude entrepreneurs who face barriers to formal financial services. Hamdan et al. (2021) explore the challenges small business owners in Uganda encounter when adopting mobile money. Their findings suggest that microentrepreneurs who rely solely on mobile money resemble banked users in being predominantly young and male, but they tend to be less wealthy and less financially literate.

This thesis contributes to the growing body of literature on mobile money and female entrepreneurship by examining its role in encouraging women to become entrepreneurs. Although previous research, such as the work by Kedir and Kouame (2022), has explored this topic in the context of Burkina Faso and Cameroon, this paper broadens the scope by including 13 African countries in diverse regions: West, East, and South Africa. This expanded geographical focus allows for a more nuanced understanding of how mobile money influences women's entrepreneurial behavior in varying socioeconomic, cultural, and institutional contexts.

3 Data

3.1 Data Description

This section describes the measurement strategies used across the different country surveys to ensure comparability and that the responses are nationally representative. I compile data on entrepreneurial activity, financial access and demographics in 13 African countries using FinScope Consumer and FinAccess surveys.[7] The FinScope Consumer Surveys are managed by Finmark Trust, a non-profit organization in South Africa that aims to provide demand-side data on financial services. Their goal is to analyze how financial markets can better serve people living in poverty by promoting financial inclusion and regional financial integration. While Finmark Trust has FinScope Consumer Surveys for 26 African countries, not all are included in this study due to limited information on respondents' experiences with mobile money or data corruption issues. I restrict my analysis to surveys conducted between 2014 and 2024 for this same reason.

The FinScope Consumer Surveys employ a multi-stage sampling strategy. First, enumeration areas (EAs) are selected using probability proportional to size based on recent

7. The countries are Benin, Botswana, Burkina Faso, Ghana, Kenya, Lesotho, Madagascar, Mauritius, Namibia, Nigeria, Rwanda, Swaziland, and Zimbabwe.

census estimates. Next, households are chosen, and within each household, one individual is randomly selected using the Kish Grid, which ensures unbiased respondent selection. Data collection is conducted through face-to-face interviews. In most countries included in this study, individuals aged 16 and above qualify for participation.

Three countries, Ghana, Nigeria, and Kenya, are administered by separate organizations that are not FinMark Trust. However, the sampling methodology and questionnaire measurement are comparable. Nigeria's surveys are conducted by Enhancing Financial Innovation and Access (EFInA), a development organization focused on promoting financial inclusion in Nigeria through research. Similarly, Ghana's surveys are conducted by IPSOS, a global market research firm, in collaboration with Ghana's Ministry of Finance. For Kenya, I use the FinAccess Surveys, as they provide more recent data compared to the FinScope Consumer Surveys. The FinAccess Surveys are managed by the Kenya National Bureau of Statistics (KNBS), the Central Bank of Kenyan (CBK), and the Financial Sector Deepening (FSD) of Kenya. The objective of these surveys is to track developments and progress in Kenya's financial landscape.

The FinAccess Surveys utilize the Kenya Household Master Sample Frame (K-HMSF), which employs a two-stage stratified cluster sampling design. Clusters serve as primary sampling units. They can be entire EAs, parts of an EA, or a combination of EAs, depending on the number of households within each EA. In the second stage, households within the selected clusters are identified through a household mapping and listing exercise. The Kish Grid is then used to randomly select respondents from these households. For the FinAccess Surveys, individuals aged 16 and above are eligible to participate.

3.1.1 Cross-Country Data Harmonization

This segment of the chapter describes how variables were recorded during survey collection. There was variation in question wording but I implemented various adjustments to ensure consistency among key variables. My outcome variable of interest is the respondent's oc-

cupation, which is categorized according to their main source of income. The categories include farming and fishing, self-employment, formal employment, informal employment, reliance on remittances, another main source of income, or no income. I record a respondent as an entrepreneur if their main source of income is "entrepreneurship", "self-employment" or "has a business". The respondent's occupation is selected as the dependent variable because it indicates whether an individual is engaged in entrepreneurship and if it serves as their primary source of income.

Mobile money use, which is binary, is my independent variable of interest. While mobile money awareness and registration are important, they do not always translate into active use. Mobile money's impact on a woman's decision to become an entrepreneur can only occur if she uses its services.

I limit the remaining variables in my dataset to demographic and financial factors. These include the respondent's location and whether they live in an urban or rural area. Residing in a region with more economic activity often requires more frequent transactions, which could increase mobile money use. Additionally, better network coverage in certain locations may encourage more mobile money transactions.

I include age, gender, and highest educational level because younger individuals, women, and those with limited education have historically been excluded from the formal financial sector. Marital status is also important, as a woman's spouse may influence her decision to pursue entrepreneurship and use mobile money to maintain financial privacy. Housing status offers insight into a respondent's socio-economic class.

Other binary variables include mobile phone access, savings behavior, bank account ownership, and whether the respondent is the head of the household. Mobile phone is a necessity for mobile money use. Savings behavior provides insight into a respondent's financial habits. Bank account ownership helps examine whether mobile money users overlap with traditional banking customers. Household heads often have greater control over finances and may be more inclined to use mobile money for convenience.

In some countries within the dataset, the lowest recorded administrative unit for respondents was the first-level division, such as a state, province, or region. However, other countries lacked data on the first-level administrative division and only provided information on the second-level division. To ensure consistency across all countries, I aggregated the second-level administrative divisions into their respective first-level divisions.

In the 2022 FinScope survey for Zimbabwe, a respondent's age was recorded as an age group. To maintain consistency across all 13 other countries, I created a new variable, "age group" using the same age brackets as those recorded in this survey. To standardize the variable on saving habits, I classified respondents as "saves" if they had set money aside at the time of the interview, within the past twelve months, if they saved whenever possible, or if they consistently save any leftover money.

Furthermore, variables related to mobile phone access varied across countries. Some surveys asked whether respondents had access to a mobile phone, whether they owned one, or whether they or someone in their household used one. To harmonize this, I created a variable that indicates whether the respondent had access to a mobile phone, regardless of ownership.

Table 1: Individual Level Demographics by Mobile Money Use and Gender

	Women		Men	
	Use	Do Not Use	Use	Do Not Use
A. Respondent Characteristics				
Educational Level				
No Formal Education	14.86	28.19	10.68	21.12
Some Education	71.90	63.64	70.83	65.32
Higher Education	13.25	8.17	18.49	13.56
Marital Status				
Married	50.34	62.65	65.54	63.74
Divorced	8.32	6.03	5.04	4.48
Widowed/Single	41.34	31.32	29.43	31.79
Main Source of Income				
Farming	17.41	18.64	22.99	31.85
Entrepreneurship	23.61	32.64	19.75	30.38
Employed	28.30	12.23	39.66	19.33
Residence				
Urban	56.92	39.43	58.63	33.15
Rural	43.08	60.57	41.37	66.85
Dwelling Status				
Owns House	60.70	65.48	64.41	70.65
Does Not Own House	39.30	34.52	35.59	29.35
Mobile Phone Access				
Mobile Phone Access	96.85	71.58	97.46	78.90
No Mobile Phone Access	3.15	28.42	2.54	21.10
Bank Account Ownership				
Bank Account Ownership	31.25	23.36	38.69	33.29
No Bank Account Ownership	68.75	76.64	61.31	66.71
Savings Behavior				
Save Money	67.98	52.45	69.63	59.65
Does Not Save Money	32.02	47.55	30.37	40.35
Average Age	41	37	41	39
N Observations	29380	72548	32411	66707

Table 1 provides a summary of individual-level characteristics for mobile money users and non-users, disaggregated by gender. I examine how these relate to mobile money use, and show the pattern aligns with the findings of Fall et al. (2020), who identify gender, age, and educational level as key determinants of adoption and use. Across both men and women, mobile money users have higher levels of education on average than non-users. Majority of mobile money users are married, like non-users. However, a higher percentage of female users are widowed or single compared to the other groups. Employment, both formal and informal, is their most common source of income. Entrepreneurship is the most common source of income for female non-users and farming for male non-users. Users are also more likely to reside in urban areas and own their homes. Additionally, they are more likely to have mobile phone access, and report saving money. While a higher proportion of mobile money users own bank accounts compared to non-users, majority of users do not own bank accounts.

Overall, the table shows that mobile money users tend to be more urban, better educated, more financially connected, and more likely to engage in employment, with patterns holding across both women and men.

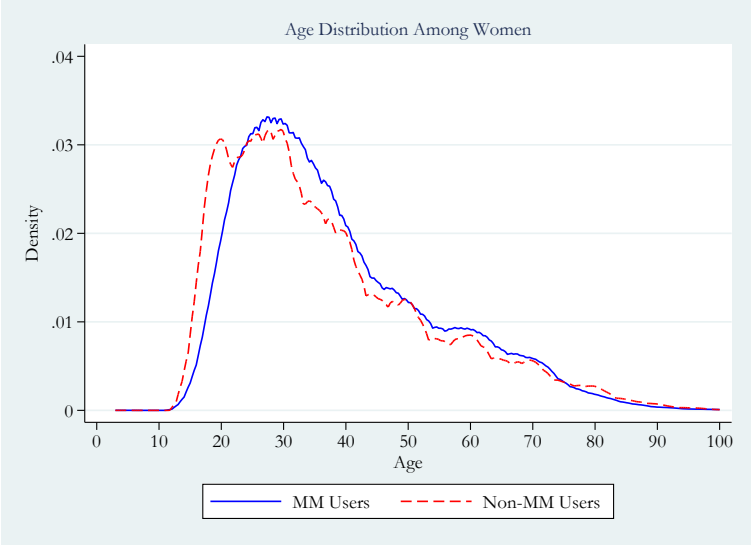

Figure 1: Age Distribution of Female Mobile Money Users

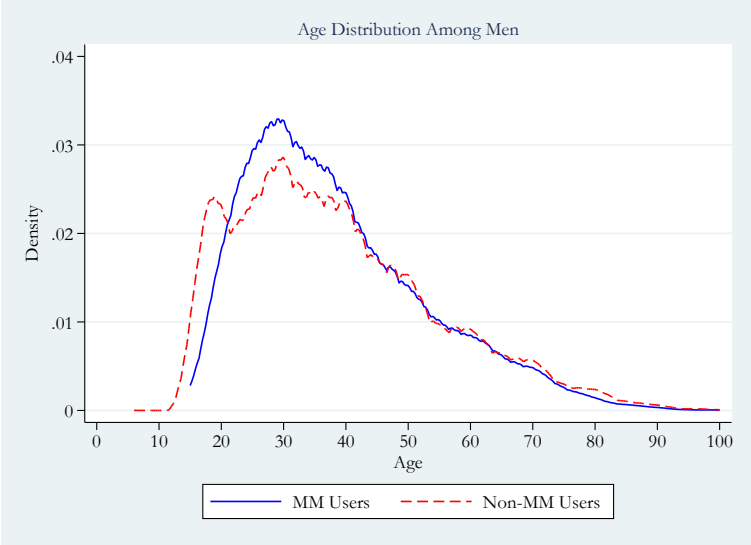

Figure 2: Age Distribution of Male Mobile Money Users

Figs.1 and 2 compare the age distribution of mobile money users and non-users by gender. Most female users fall between the ages of 20 and 40, with usage peaking in their thirties. The age distribution of female non-users is similar to that of users. Fig.2 shows most male users also fall between the ages of 20 and 40 but there is a higher proportion of men in their fifties using mobile money. Male non-users also tend to be between the ages of 20 and 40. This suggests that age may not be a strong determinant of mobile money use.

3.2 Gendered Patterns in Entrepreneurship and Mobile Money

Table 2: Main Income Source Across Countries

	Women		Men		N
	Entrepreneur	Employed	Entrepreneur	Employed	
Country					
Benin	22.10	3.91	17.85	10.05	6948
Botswana	14.16	34.87	11.18	55.07	2336
Burkina Faso	17.86	5.91	17.98	8.52	5066
Ghana	47.25	10.78	33.64	18.22	5156
Kenya	15.83	28.59	13.82	39.28	51560
Lesotho	9.76	13.96	10.07	19.18	2999
Madagascar	25.79	14.04	18.08	20.31	5037
Mauritius	7.11	22.75	18.17	47.65	4000
Namibia	14.56	37.71	12.92	56.15	1863
Nigeria	35.45	11.15	31.97	18.85	108341
Rwanda	6.34	34.65	7.70	37.81	12480
Swaziland	16.12	24.95	10.33	53.89	6368
Zimbabwe	11.94	23.65	10.94	40.80	7000

Notes: Kenya, Nigeria, Swaziland and Zimbabwe contain data from surveys conducted in multiple years. Employment includes formal and informal employment

This section highlights the variability in entrepreneurship rates, levels of mobile money awareness, registration, and use across men and women in the 13 Sub-Saharan African countries. These patterns suggest that country-specific factors may influence individuals' decisions to become entrepreneurs and engage with mobile money. Table 2 shows entrepreneurship and direct employment rates among men and women in the 13 countries of interest. In more than half of the countries, women engage more with entrepreneurship than direct employment. This highlights the significance of female entrepreneurship in Sub-Saharan Africa. The higher level of female entrepreneurship could be driven by various factors. Limited employment opportunities may push women toward entrepreneurship as a necessary means of generating income. Additionally, the flexibility of entrepreneurship allows women to balance

their business activities while fulfilling cultural and societal expectations of taking care of their homes.

Table 3: Engagement With Mobile Money Across Countries

	Women			Men		
	Aware	Registered	Use	Aware	Registered	Use
Country						
Benin	68.22	18.86	27.39	75.44	34.09	41.41
Botswana	-	-	48.83	-	-	48.44
Burkina Faso	74.88	9.85	22.0	84.41	17.03	32.59
Ghana	96.07	76.91	85.65	97.11	82.97	88.95
Kenya	-	-	75.51	-	-	81.52
Lesotho	95.60	68.15	71.22	96.07	63.57	65.39
Madagascar	72.44	17.86	23.55	72.71	15.58	20.08
Mauritius	21.43	3.89	1.02	32.21	6.85	1.26
Namibia	-	-	32.14	-	-	32.80
Nigeria	16.22	2.37	3.23	23.15	4.18	5.53
Rwanda	41.12	59.92	21.58	56.21	72.17	17.83
Swaziland	91.32	71.93	74.94	93.13	65.92	68.92
Zimbabwe	77.93	52.11	42.44	80.0	57.06	44.85

Notes: Kenya, Nigeria, Swaziland and Zimbabwe contain data from surveys conducted in multiple years. No information on mobile money awareness is available for Botswana, Kenya, and Namibia.

Table 3 demonstrates the proportions of individuals who are aware of, registered with, and use mobile money across 13 Sub-Saharan African countries. Awareness refers to having heard of mobile money, registration indicates ownership of a mobile money account, and use captures current or past engagement with mobile money services. The percentage of men and women who are aware of mobile money is similar in most countries, although men tend to have slightly higher awareness than women. Nigeria has the lowest level of awareness of mobile money among all the countries, while Ghana, Lesotho, and Swaziland have the highest awareness. However, awareness of mobile money does not provide enough insight into individuals' actual engagement with mobile money services. In countries like Nigeria, low awareness could indicate a lack of targeted campaigns on mobile money. On the other hand,

higher awareness in Ghana, Lesotho, and Swaziland may be linked to successful initiatives promoting mobile money adoption.

Mobile money registration is lower than mobile money awareness across all countries. The registration rates of mobile money vary significantly, with Ghana, Lesotho, Rwanda, Swaziland, and Zimbabwe showing higher registration rates, where more than half of the respondents are registered with a mobile money provider. This suggests that while many individuals are aware of mobile money providers, barriers such as access to mobile phones and lack of trust in digital finance may negatively affect mobile money registration.

In most countries, mobile money usage surpasses mobile money registration. This may mean that some individuals use mobile money services without being registered with a provider, possibly relying on others' accounts to access these services.[8] Mobile money usage is a more accurate measure of female entrepreneurs' engagement with mobile money, as it reveals whether they use mobile money for financial services, rather than just having an account with a mobile money provider.

8. In Mauritius, Rwanda, and the 2014 Zimbabwe survey, mobile money use refers to accessing another person's account

3.3 Mobile Money and Entrepreneurship Over Time

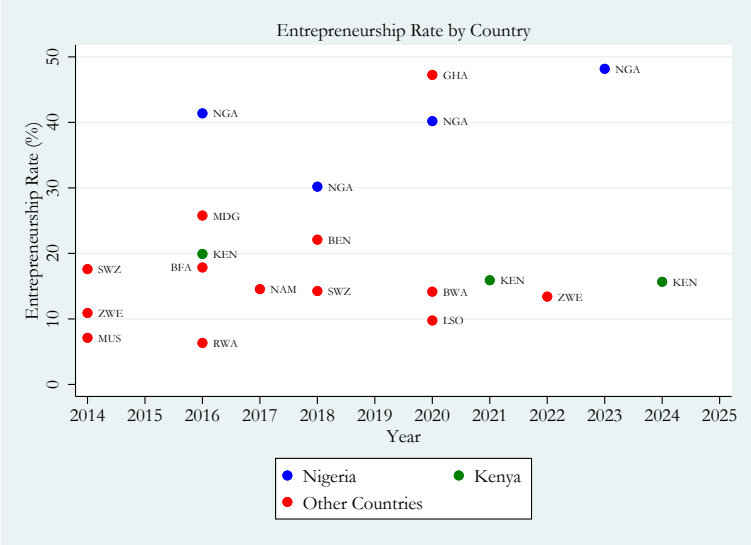

Figure 3: Entrepreneurship Over Time by Country

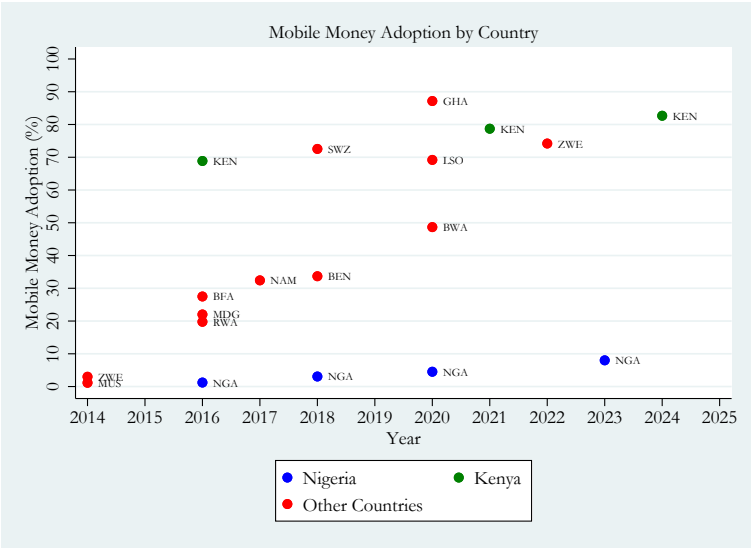

Figure 4: Mobile Money Adoption Over Time by Country

I create scatter plots showing the relationship between mobile money adoption and entrepreneurship over time and across countries, focusing exclusively on women. Figs. 3 and 4 illustrate trends in mobile money use and entrepreneurship over time, while Fig. 5 provides suggestive evidence regarding the relationship between them. Fig. 3 reveals that there

is no clear time trend in entrepreneurship. For most countries, female entrepreneurship rates remained below 30% between 2014 and 2025. Ghana has one of the highest female entrepreneurship rates, exceeding 40%. In contrast, Nigeria, Swaziland, and Kenya experienced a year-on-year decline. I highlight Nigeria and Kenya in different colors because I conduct a comparative analysis on these two countries later in the paper. Kenya is often considered the quintessential case of mobile money adoption, while Nigeria, the most populous country in Sub-Saharan Africa, appears to follow a different pattern. After this, Nigeria experienced a steady increase in entrepreneurship rates, while Kenya's rate remains relatively constant. Zimbabwe also shows an increase in its female entrepreneurship rate between 2014 and 2022.

Fig. 4 highlights a general increase in mobile money adoption among women between 2014 and 2025. Zimbabwe, in particular, witnessed a dramatic surge, with adoption rates climbing from under 10% in 2014 to over 70% by 2022. Kenya, Swaziland, Lesotho, Zimbabwe, and Ghana each had adoption rates exceeding 50%, with Ghana approaching 90%. In contrast, mobile money adoption among women in Nigeria and Mauritius remained low, staying under 10% despite a steady increase in Nigeria.

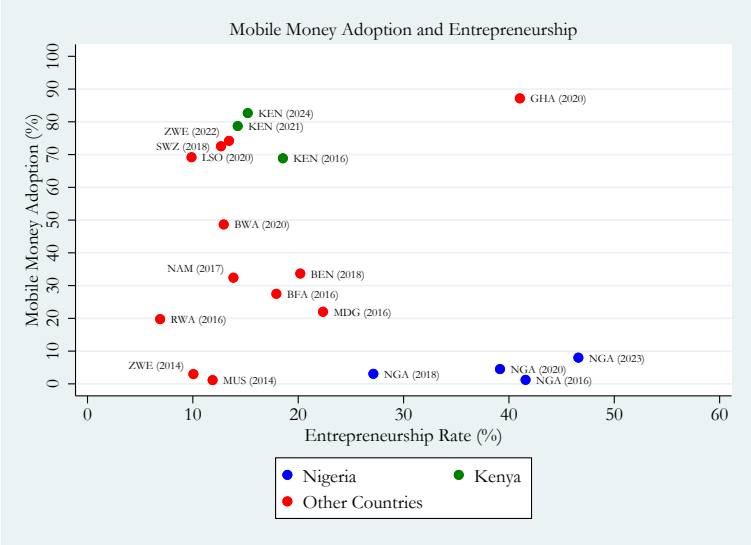

Figure 5: Relationship Between Mobile Money Adoption and Entrepreneurship Rate by Country

To examine the relationship central to my research question, whether mobile money use influences women's likelihood of becoming entrepreneurs, I compare mobile money adoption rates with entrepreneurship rates across countries. Fig. 5 suggests a slight negative relationship between mobile money adoption and entrepreneurship rates across countries. Countries with higher mobile money adoption do not necessarily have higher entrepreneurship rates. Ghana is the only country with both high mobile money adoption and a high entrepreneurship rate. In contrast, countries like Kenya, Swaziland, Zimbabwe, and Lesotho exhibit high mobile money adoption but entrepreneurship rates below 30%. Nigeria shows the opposite pattern with the highest entrepreneurship rates but mobile money adoption remains below 10%. Namibia, Botswana, Benin, Burkina Faso, and Madagascar fall in the mid-range, with mobile money adoption between 20% and 50%, but their entrepreneurship rates still below 30%. Rwanda's mobile money adoption rate is around 20% with its entrepreneurship under 10%. Mauritius records both mobile money adoption and entrepreneurship rates that are below 20%. These patterns across countries highlights the need for more formal controls, as the relationship between mobile money use and entrepreneurship cannot be determined from Fig. 5 alone.

3.4 Exploring Determinants of Mobile Money Adoption: Mobile Phone Access and Bank Account Ownership

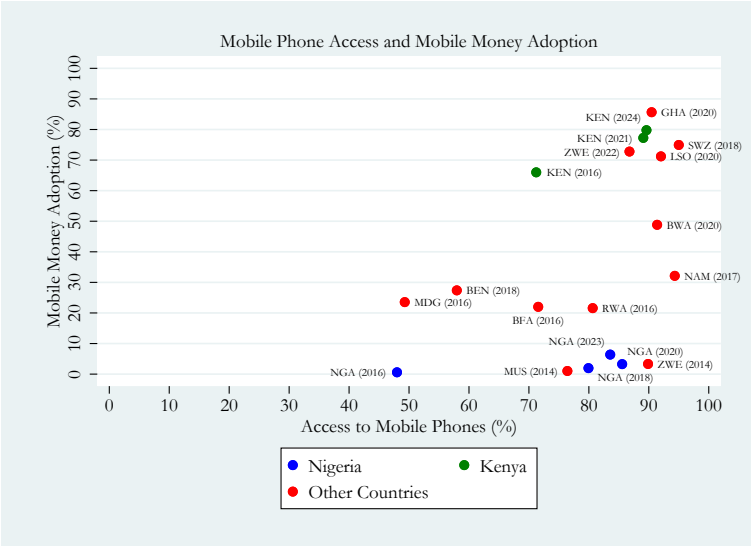

Figure 6: Mobile Phone Access by Country

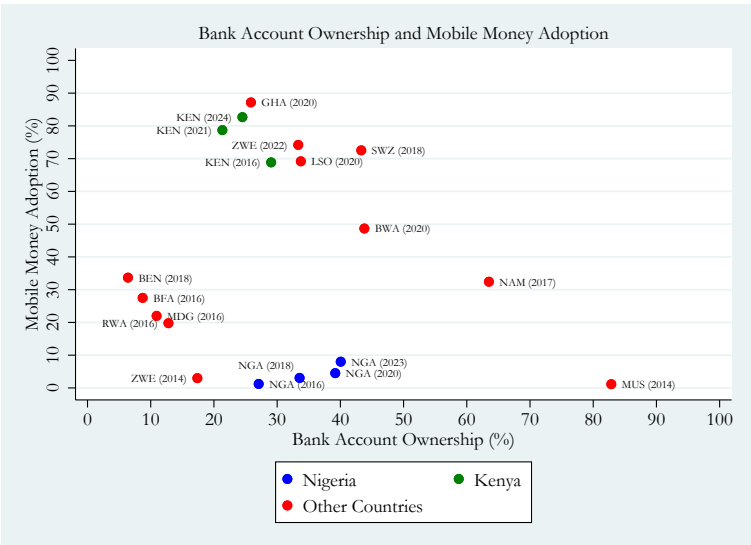

Figure 7: Bank Penetration by Country

I first hypothesize that the differences in mobile money adoption rates may be explained by individuals' access to mobile phones. Mobile phone access increases steadily in Kenya, Nigeria, and Zimbabwe. While mobile phone access is important for using mobile money

services, Fig. 6 suggests that it is not the sole determinant of mobile money adoption rates in the region. Nigeria and Mauritius have high mobile phone access rates, around 80%, yet exhibit lower mobile money adoption rates compared to Benin and Madagascar, where mobile phone access is below 70%. Conversely, countries like Ghana, Kenya, Lesotho, and Swaziland have both high mobile phone penetration and high mobile money adoption rates. This analysis indicates that while mobile phone access is a necessary factor, other variables significantly influence the adoption of mobile money across Sub-Saharan Africa.

Next, I hypothesize that if countries with low mobile money adoption exhibit high bank account ownership rates, the limited adoption of mobile money may be explained by the accessibility of traditional banking services. Individuals may send, receive, borrow, and save money through their bank accounts instead. Fig. 7 shows Nigeria experienced an increase in bank account ownership over the years however, it still remains below 50%. Kenya, on the other hand, experiences a decline in bank account ownership but an increase in mobile money adoption. In contrast, Mauritius has low mobile money adoption and very high bank account ownership. This suggests that the availability of traditional banking services may influence mobile money adoption, and vice versa.

4 Linear Probability Model

Although Fig. 5 demonstrates patterns between mobile money adoption and entrepreneurship rates across countries, it is not enough to examine the relationship between these two variables. Next, I use a linear probability model, run on individual-level data, to estimate the association between mobile money use and the likelihood of entrepreneurship among women. I run the following regression:

$$Entrepreneurship_{it} = \beta_1 mm_{it} + \beta_2 female_i + \beta_3 mm_{it} \times female_i + \Gamma X_{it} + \gamma_g + \delta_t + \epsilon_{it} \quad (1)$$

The dependent variable, Entrepreneurship, is an indicator variable equal to 1 if an indi-

vidual i's main source of income was self-employment in a given year t. mm, the independent variable of interest, is an indicator variable that is 1 if the individual i uses mobile money, and 0 otherwise. $female$ is also a binary variable that is 1 if individual is a woman and 0 otherwise. The coefficient of interest, β_3, captures the additional effect of mobile money use on the likelihood of being an entrepreneur for women, relative to men. If this coefficient is positive and significant, mobile money use increases the probability of entrepreneurship more for women than for men. β_1 estimates the impact of mobile money use on the likelihood of a man being an entrepreneur. β_2 estimates the difference in the likelihood of women becoming entrepreneurs. X_i is a vector of control variables like age, educational level, and bank ownership status, excluding gender. γ_g is the area fixed effects for area g and δ_t is the year fixed effects. ϵ_i is the error term.

4.1 Results

Table 4 presents results from a linear probability model estimating the relationship between mobile money use and the likelihood of becoming an entrepreneur, with a focus on gender differences. Across all specifications, mobile money use demonstrates a stronger positive association with entrepreneurship among women than men.

Column (1) provides a baseline specification with no controls. Among men, mobile money use is associated with a 10.6 percentage point decrease in the probability of being an entrepreneur. Women are 2.3 percentage points more likely than men to be entrepreneurs. This is consistent with the descriptive statistics in Table 2 that suggested higher entrepreneurship among women. The interaction term between mobile money use and being female is positive and significant, which indicates that female mobile money users are 1.6 percentage points more likely to be entrepreneurs compared to male mobile money users.

Column (2) introduces area fixed effects to control for regional characteristics such as infrastructure or business culture. With this adjustment, the association between mobile money usage and the likelihood of entrepreneurship for men becomes positive and remains

significant. Women remain more likely than men to become entrepreneurs but the magnitude of this difference decreases by 0.2 percentage points. The additional effect of mobile money for women grows to 2.2 percentage points.

In column (3), I control for year fixed effects to account for economic or policy changes over time that might affect the likelihood of becoming an entrepreneur for an individual. The effect of mobile money use on the likelihood of becoming an entrepreneur for men remains positive and significant but decreases to 5.8 percentage points. There is also a decrease in the difference between the likelihood of entrepreneurship between women and men. Women who use mobile money are 2.5 percentage points more likely to become entrepreneurs than their male counterparts.

In column (4), I include individual-level controls such as education, marital status, household headship, age, home ownership, and whether someone lives in an urban area. These variables were chosen because they are characteristics that influence entrepreneurial decisions and may be correlated with mobile money use. After accounting for these, the effect of mobile money usage on the likelihood of a man becoming an entrepreneur decreases to 4.8 percentage points but remains positive and significant. Women become 3.7 percentage points more likely to become entrepreneurs compared to their male counterparts. The additional effect of mobile money on the likelihood of a woman becoming an entrepreneur decreases by 0.2 percentage points.

Additionally, people with higher education are 4.2 percentage points less likely to be entrepreneurs. This may be because these individuals possess the skills to access employment instead of pursuing entrepreneurship. Widowed or single individuals are 9.2 percentage points less likely to be entrepreneurs, perhaps due to lower financial security or fewer support networks. Household heads are 5.3 percentage points more likely to be entrepreneurs, possibly due to the fact that they bear more financial responsibilities. At younger ages, the probability of being an entrepreneur decreases. However, after a certain age, as individuals get older, the probability of entrepreneurship starts to increase again. Individuals who own

homes are 4.3 percentage points less likely to become entrepreneurs which could imply they are more financially stable or already employed. Living in an urban area is associated with a 0.9 percentage point increase in the likelihood of entrepreneurship. This may be because they have better market access and resources.

Finally, in column (5), I control for mobile phone access, bank account ownership, and savings behavior. These factors may be correlated with both mobile money use and entrepreneurship, and are themselves endogenous. Controlling for them helps isolate the independent association between mobile money use and entrepreneurship, but it may also obscure part of the relationship due to endogeneity or multicollinearity. Once these controls are included, male mobile money users are 1 percentage point more likely to engage in entrepreneurship compared to male non-users. This suggests that part of the earlier effect was actually capturing the benefits of having access to phones, banks, or savings. The difference in the likelihood of entrepreneurship between men and women increases by 4.6 percentage points from 3.7 percentage points in column (4). Mobile money continues to have an added effect for women but the magnitude of this effect decreases by 1.1 percentage points.

Mobile phone access increases the likelihood of entrepreneurship by 7.5 percentage points. This may be because mobile phones can expand market access, help with mobile payments or marketing. Having a bank account is associated with a 3.2 percentage point increase in the likelihood of becoming an entrepreneur, probably due to better access to credit or financial services. Individuals who save money are 11.4 percentage points more likely to become entrepreneurs because they might be saving to become entrepreneurs.

Table 4: Linear Probability Regression

	(1)	(2)	(3)	(4)	(5)
Mobile Money Use	-0.106***	0.062***	0.058***	0.048***	0.010***
	(0.0030)	(0.0036)	(0.0037)	(0.0037)	(0.0038)
Female	0.023***	0.021***	0.018***	0.037***	0.046***
	(0.0024)	(0.0023)	(0.0023)	(0.0025)	(0.0025)
MM Use × Female	0.016***	0.022***	0.025***	0.023***	0.012***
	(0.0043)	(0.0041)	(0.0041)	(0.0042)	(0.0042)
Some Education				0.054***	0.027***
				(0.0029)	(0.0029)
Higher Education				-0.042***	-0.103***
				(0.0039)	(0.0042)
Divorced/Separated				0.011**	0.019***
				(0.0043)	(0.0042)
Widowed/Single				-0.092***	-0.076***
				(0.0022)	(0.0022)
Household Head Status				0.053***	0.044***
				(0.0024)	(0.0023)
Age				-0.001***	-0.000***
				(0.0001)	(0.0001)
Age^2				0.000***	0.000***
				(0.0000)	(0.0000)
House Ownership Status				-0.048***	-0.044***
				(0.0023)	(0.0023)
Urban				0.009***	0.003
				(0.0022)	(0.0022)
Mobile Phone Access					0.075***
					(0.0029)
Bank Account Ownership					0.032***
					(0.0025)
Saves Money					0.114***
					(0.0021)
Area FE	No	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
Constant	0.304***	0.098***	0.065***	0.101***	0.041*
	(0.0017)	(0.0216)	(0.0223)	(0.0224)	(0.0223)
Observations	203526	203526	203526	199251	199242
R^2	0.011	0.096	0.110	0.127	0.146

Standard Error in parentheses
Age excludes 2022 survey from Zimbabwe
* $p < .10$, ** $p < .05$, *** $p < .01$

4.2 Comparing Nigeria With Kenya

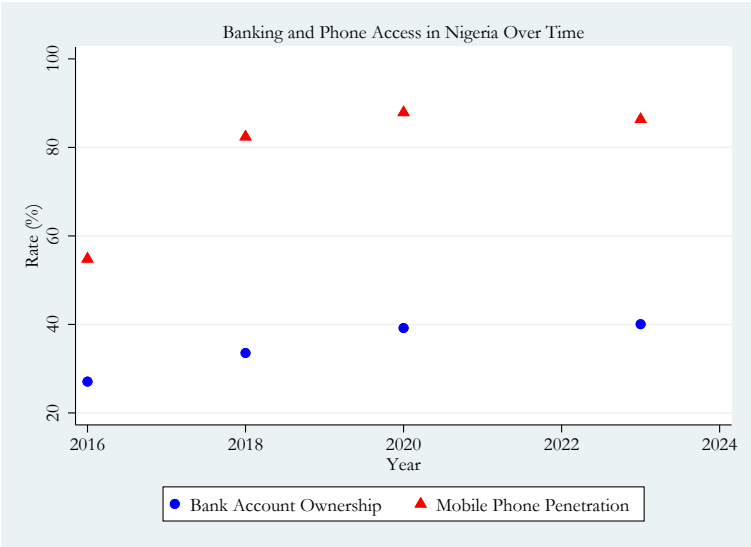

Figure 8: Bank Account Ownership in Nigeria

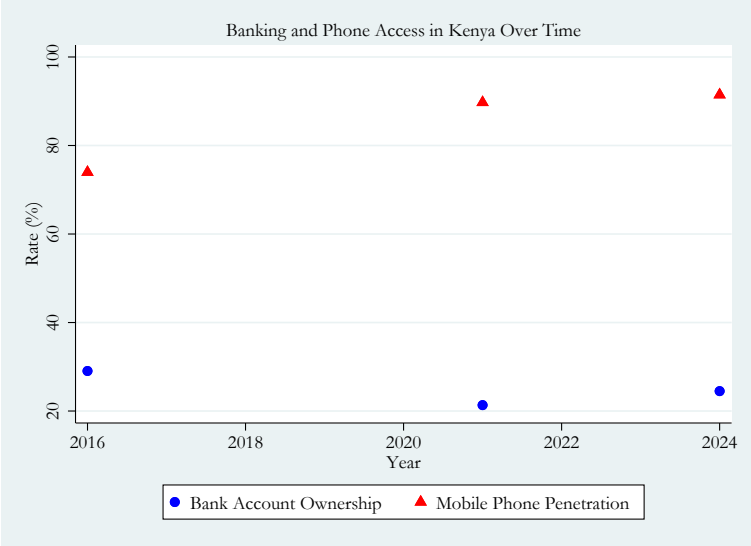

Figure 9: Bank Account Ownership in Kenya

I conduct further analysis on Nigeria because its mobile money adoption rate stands out as an anomaly. Unlike most countries in the dataset, Nigeria's low adoption rate seems inconsistent with my original hypothesis: that mobile phone access facilitates mobile money use by providing the necessary technology, while high bank account penetration may reduce

the need for mobile money due to substitution effects. Despite relatively high mobile phone access, mobile money adoption in Nigeria remains low. At the same time, bank account ownership is not widespread enough to serve as a substitute for mobile money, as it remains under 50% and is similar to levels observed in countries with high mobile money adoption. To better understand this, I examine trends in mobile phone and bank account penetration in Nigeria to assess whether their levels can explain its mobile money adoption rate. I then compare these trends with Kenya, a country with consistently high mobile money adoption

Fig. 8 shows a steady increase in mobile phone penetration in Nigeria, rising from below 60% in 2016 to over 80% by 2023. Bank account ownership also increases gradually, from just above 20% to around 40%.

Fig. 9 displays the analogous trends in Kenya. Like Nigeria, mobile phone penetration increases steadily, from above 70% in 2016 to nearly 90% by 2024. Although Kenya starts at a higher level, the pace of growth is comparable to Nigeria. However, bank account ownership follows a different trajectory. While penetration in 2016 was similarly below 40%, it drops to about 20% in 2021 and remains just above that level in 2024.

At first glance, Nigeria seems like an anomaly, but further analysis suggests an interpretation that is consistent with my hypothesis. Mobile money can act as a substitute for traditional banking. In Kenya, where bank penetration remains low, mobile money has become the dominant form of financial access. In Nigeria, by contrast, the government or non-governmental organizations (NGOs) may be prioritizing formal banking expansion as the main strategy for increasing financial inclusion, possibly at the expense of mobile money growth. Alternatively, financial inclusion may not be a major focus for them.

Table 5: Individual Level Demographics by Mobile Money Use and Gender in Nigeria

	Women		Men	
	Use	Do Not Use	Use	Do Not Use
A. Respondent Characteristics				
Educational Level				
No Formal Education	1.98	25.37	1.69	19.39
Some Education	53.68	64.16	45.25	63.66
Higher Education	44.33	10.47	53.06	16.95
Marital Status				
Married	55.71	66.88	50.80	66.66
Divorced	4.15	6.07	3.05	4.78
Widowed/Single	40.15	27.05	46.16	28.56
Main Source of Income				
Farming	3.85	14.95	10.24	30.66
Entrepreneurship	46.18	40.01	36.69	36.91
Employed	23.49	10.74	36.79	17.79
Residence				
Urban	70.51	37.24	61.55	30.00
Rural	29.49	62.76	38.45	70.00
Dwelling Status				
Owns House	43.35	65.90	47.30	70.19
Does Not Own House	56.65	34.10	52.70	29.81
Mobile Phone Access				
Mobile Phone Access	98.19	74.66	98.75	81.80
No Mobile Phone Access	1.81	25.34	1.25	18.20
Bank Account Ownership				
Bank Account Ownership	78.78	27.64	84.63	39.16
No Bank Account Ownership	21.22	72.36	15.37	60.84
Savings Behavior				
Save Money	80.76	56.15	83.24	64.91
Does Not Save Money	19.24	43.85	16.76	35.09
Average Age	32	36	35	40
N Observations	1767	53021	2960	50593

Table 6: Individual Level Demographics by Mobile Money Use and Gender in Kenya

	Women		Men	
	Use	Do Not Use	Use	Do Not Use
A. Respondent Characteristics				
Educational Level				
No Formal Education	16.64	36.50	10.70	19.95
Some Education	70.40	62.18	73.13	78.57
Higher Education	12.96	1.31	16.18	1.49
Marital Status				
Married	49.23	36.79	70.85	35.34
Divorced	9.49	4.51	5.73	4.09
Widowed/Single	41.28	58.70	23.41	60.57
Main Source of Income				
Farming	21.16	22.89	24.81	21.43
Entrepreneurship	19.57	7.88	16.10	5.51
Employed	31.89	18.42	42.66	24.37
Residence				
Urban	58.88	74.72	61.97	76.21
Rural	41.12	25.28	38.03	23.79
Dwelling Status				
Owns House	67.34	83.46	70.75	84.81
Does Not Own House	32.66	16.54	29.25	15.19
Mobile Phone Access				
Mobile Phone Access	96.72	50.43	97.31	57.51
No Mobile Phone Access	3.28	49.57	2.69	42.49
Bank Account Ownership				
Bank Account Ownership	25.53	5.15	32.08	4.51
No Bank Account Ownership	74.47	94.85	67.92	95.49
Savings Behavior				
Save Money	75.65	44.00	73.07	39.99
Does Not Save Money	24.35	56.00	26.93	60.01
Average Age	40	38	40	32
N Observations	30340	72907	33291	66988

To better understand mobile money adoption patterns, I examine the individual-level demographics of users and non-users in Nigeria and Kenya. Tables 5 and 6 present these demographics by gender and mobile money use status. A much larger share of users, both women and men, have higher education than non-users in Nigeria and Kenya. However, the share of mobile money users who are highly educated is higher in Nigeria than in Kenya. Relative to non-users, mobile money users are more likely to be employed in both countries. While mobile money users tend to be urban residents in both countries, a greater share of rural individuals use mobile money in Kenya compared to Nigeria. On average, Nigerian users do not own their own homes but Kenyan users own their homes. This may be because mobile money users in Kenya tend to be older than users in Nigeria.

In both countries, individuals who use mobile money have access to mobile phones on average. However, the relationship between bank account ownership and mobile money use differs. In Nigeria, users are more likely to own bank accounts, suggesting mobile money compliments formal finance. In Kenya, however, the majority of users do not have a bank account, implying that mobile money may be acting as a substitute for traditional banking. A greater share of users save on average compared to non-users. This reinforces the idea that people use mobile money as a savings tool.

Overall, this comparison suggests that mobile money in Kenya is more widely adopted across socio-economic groups, whereas in Nigeria, it remains concentrated among a relatively advantaged subset of the population. However, formal regressions below show that mobile money is still particularly helpful for women's entrepreneurship in Nigeria, just as in Kenya, despite these demographic differences in adoption.

4.2.1 Regression Results for Nigeria and Kenya

Table 7: Linear Probability Regression on Nigeria and Kenya

	Nigeria		Kenya	
	(1)	(2)	(3)	(4)
Mobile Money Use	-0.058***	-0.012	0.111***	0.053***
	(0.0091)	(0.0091)	(0.0056)	(0.0060)
Female	0.018***	0.045***	0.012*	0.017**
	(0.0030)	(0.0036)	(0.0068)	(0.0068)
MM Use × Female	0.037**	0.027*	0.020***	0.025***
	(0.0146)	(0.0144)	(0.0076)	(0.0076)
Some Education		0.059***		0.019***
		(0.0043)		(0.0054)
Higher Education		-0.066***		-0.013*
		(0.0056)		(0.0071)
Divorced/Separated		0.017**		0.001
		(0.0067)		(0.0064)
Widowed/Single		-0.113***		-0.042***
		(0.0034)		(0.0038)
Household Head Status		0.075***		0.014***
		(0.0038)		(0.0037)
Age		-0.001***		0.008***
		(0.0001)		(0.0005)
Age^2		0.000***		-0.000***
		(0.0000)		(0.0000)
Household Ownership Status		-0.026***		-0.059***
		(0.0036)		(0.0045)
Urban		0.038***		-0.060***
		(0.0036)		(0.0041)
Area FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Constant	0.355***	0.340***	0.066***	0.041**
	(0.0098)	(0.0124)	(0.0131)	(0.0175)
Observations	108341	106811	51560	51469
R^2	0.050	0.073	0.043	0.071

Standard Error in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

I estimate separate regressions for Nigeria and Kenya to assess whether the effect of mobile money on women's likelihood of entrepreneurship mirrors the pattern observed in the full sample. Table 7 explores the relationship between mobile money use and the likelihood of entrepreneurship in Nigeria and Kenya. In column (1), I include year and area fixed effects to account for national-level changes over time and regional characteristics. In Nigeria, men who use mobile money are 5.8 percentage points less likely to become entrepreneurs compared to male non-users. Women are 1.8 percentage points more likely to become entrepreneurs compared to men. The additional likelihood that a female mobile money user becomes an entrepreneur is 3.7 percentage points.

Column (2) introduces controls on education, marital status, household headship, age, home ownership, and urban residence. The effect of mobile money on the likelihood of entrepreneurship for men becomes insignificant and negative. This indicates that its earlier significance likely reflected correlated traits of being highly educated or other demographic differences. However, women are now 4.5 percentage points more likely than men to be entrepreneurs, and the additional effect of mobile money use for women remains positive and significant at 2.7 percentage points. This shows that mobile money use still plays a distinct and beneficial role for women in Nigeria, even after accounting for individual factors.

The results from this table suggest that mobile money continues to serve as a meaningful tool for female entrepreneurs in Nigeria, potentially compensating for barriers in the formal financial sector or mitigating pressures within the household. This aligns with Riley (Riley 2024) who finds that mobile money provides women with greater financial autonomy by limiting the demands placed on their income within the household.

As a comparison, columns (3) and (4) in Table 7 examine the relationship between mobile money use and entrepreneurship in Kenya. Year and area fixed effects are included in column (3) and male mobile money users are 11.1 percentage points more likely to be entrepreneurs than male non-users. The likelihood that a Kenyan woman is an entrepreneur is 1.2 percentage points. Women who use mobile money are 2 percentage points more likely

to become entrepreneurs than their male counterparts who also use mobile money.

Column (4) introduces additional controls for education, marital status, household headship, age, homeownership, and sector. Here, the effect of mobile money use on the likelihood of entrepreneurship for men becomes 5.3 percentage points. The likelihood that a woman becomes an entrepreneur increases to 1.7 percentage points than men, and women who use mobile money are 2.5 percentage points more likely to become entrepreneurs than male mobile money users.

These results point to important contrasts between Kenya and Nigeria. In Kenya, mobile money is consistently associated with a higher likelihood of entrepreneurship for men, and this effect remains positive and significant even after introducing full controls. In Nigeria, however, the relationship between mobile money use and male entrepreneurship is either insignificant or negative. Additionally, while mobile money provides a gendered advantage in both countries, the magnitude of its effect is stronger for Nigerian women, possibly reflecting a greater gap in access to traditional financial services.

While mobile money enhances entrepreneurship in both countries, its reach and function differ. In Nigeria, it plays a stronger role in supporting women's finances, while in Kenya, it is a more widespread financial tool across both genders.

4.2.2 Heterogeneous Responses to Mobile Money Use in Kenya and Nigeria: Phone and Bank Account Users

Table 8: Linear Probability Regression by Phone Access: Nigeria and Kenya

	Nigeria		Kenya	
	(1)	(2)	(3)	(4)
	No Phone Access	Phone Access	No Phone Access	Phone Access
Mobile Money Use	0.028	-0.012	0.026**	0.048***
	(0.0737)	(0.0093)	(0.0122)	(0.0076)
Female	0.026***	0.057***	0.008	0.021**
	(0.0074)	(0.0040)	(0.0074)	(0.0095)
MM Use × Female	-0.038	0.011	0.029*	0.021**
	(0.1076)	(0.0147)	(0.0160)	(0.0101)
Some Education	0.036***	0.044***	-0.008	0.025***
	(0.0073)	(0.0053)	(0.0091)	(0.0062)
Higher Education	0.027	-0.095***	0.049	-0.012
	(0.0222)	(0.0064)	(0.0337)	(0.0079)
Divorced/Separated	0.002	0.021***	0.020	0.001
	(0.0140)	(0.0075)	(0.0137)	(0.0071)
Widowed/Single	-0.108***	-0.108***	-0.023***	-0.041***
	(0.0074)	(0.0039)	(0.0077)	(0.0042)
Household Head Status	0.103***	0.064***	0.030***	0.011***
	(0.0082)	(0.0043)	(0.0087)	(0.0040)
Age	-0.001**	-0.001***	0.003***	0.009***
	(0.0002)	(0.0002)	(0.0009)	(0.0006)
Age^2	0.000*	0.000***	-0.000***	-0.000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Household Ownership Status	-0.024***	-0.023***	-0.032***	-0.059***
	(0.0087)	(0.0039)	(0.0107)	(0.0049)
Urban	0.028***	0.031***	-0.022**	-0.063***
	(0.0089)	(0.0039)	(0.0090)	(0.0045)
Area FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Constant	0.271***	0.380***	0.098***	0.016
	(0.0332)	(0.0140)	(0.0303)	(0.0205)
Observations	22404	84407	6293	45176
R^2	0.069	0.077	0.115	0.065

Standard Error in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 9: Linear Probability Regression by Bank Account Ownership: Nigeria and Kenya

	Nigeria		Kenya	
	(1)	(2)	(3)	(4)
	No Bank Account	Bank Account	No Bank Account	Bank Account
Mobile Money Use	-0.004	-0.023**	0.043***	0.055**
	(0.0222)	(0.0102)	(0.0061)	(0.0273)
Female	0.041***	0.072***	0.015**	0.049
	(0.0044)	(0.0061)	(0.0066)	(0.0350)
MM Use × Female	-0.010	-0.011	0.030***	-0.008
	(0.0326)	(0.0165)	(0.0077)	(0.0355)
Some Education	0.056***	-0.023	0.019***	-0.005
	(0.0046)	(0.0148)	(0.0056)	(0.0177)
Higher Education	0.036***	-0.209***	0.018**	-0.094***
	(0.0116)	(0.0150)	(0.0093)	(0.0189)
Divorced/Separated	0.018**	0.006	-0.002	0.029*
	(0.0079)	(0.0122)	(0.0069)	(0.0163)
Widowed/Single	-0.127***	-0.084***	-0.041***	-0.045***
	(0.0043)	(0.0058)	(0.0042)	(0.0089)
Household Head Status	0.091***	0.032***	0.012***	0.007
	(0.0048)	(0.0063)	(0.0041)	(0.0087)
Age	-0.000	-0.003***	0.007***	0.007***
	(0.0002)	(0.0002)	(0.0006)	(0.0013)
Age^2	0.000	0.000***	-0.000***	-0.000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Household Ownership Status	-0.029***	-0.005	-0.070***	-0.027***
	(0.0047)	(0.0055)	(0.0052)	(0.0096)
Urban	0.033***	0.023***	-0.047***	-0.078***
	(0.0047)	(0.0055)	(0.0046)	(0.0090)
Area FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Constant	0.290***	0.529***	0.030	0.161***
	(0.0166)	(0.0237)	(0.0187)	(0.0501)
Observations	68693	38118	39169	12300
R^2	0.068	0.108	0.078	0.061

Standard Error in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

I delve into the two hypotheses discussed above, mobile phone access and bank account penetration, as potential factors influencing the relationship between mobile money and the likelihood of entrepreneurship in Nigeria and Kenya. Table 8 investigates whether the relationship between mobile money use and entrepreneurship varies depending on individuals' access to mobile phones in both countries. In column (1), among those without mobile phone access, mobile money use has no significant effect on entrepreneurship on men in Nigeria. Women are also 2.6 percentage points more likely to become entrepreneurs compared to men. Women who use mobile money are less likely to become entrepreneurs compared to male users but this effect is insignificant.

Among those with phone access, column (2), the effect remains small and statistically insignificant for male users. However, women are now 5.7 percentage points more likely to become entrepreneurs but the additional effect of mobile money on the likelihood of entrepreneurship for women continues to remain insignificant. This suggests that mobile money on its own does not appear to add much for men or women but women are nonetheless more likely than men to be entrepreneurs.

Column (3) shows that among individuals without phone access in Kenya, mobile money use is associated with a 2.6 percentage point increase in the likelihood of entrepreneurship for men. There is no significant difference in the likelihood of entrepreneurship for women and men. Notably, the additional effect of mobile money use on the likelihood of entrepreneurship for women in relation to male users is 2.9 percentage points. Mobile money agents may be why mobile money has an effect on the likelihood of entrepreneurship for individuals with mobile phones.

Among Kenyan individuals with phone access, column (4), the effect of mobile money use on the likelihood of entrepreneurship for men increases by 4.8 percentage points. Women are 2.1 percentage points more likely to become entrepreneurs than men and this difference is significant. The probability of being an entrepreneur is 2.1 percentage points higher for female mobile money users compared to male users.

Table 9 examines how the relationship between mobile money use and entrepreneurship in Kenya varies based on bank account ownership. Column (1) shows that for individuals without bank accounts in Nigeria, mobile money use has no effect on the likelihood of entrepreneurship for men. Women are also 4.1 percentage points more likely to become entrepreneurs compared to their male counterparts. There is no significant additional effect of mobile money for women compared to men.

However, Column (2) shows that for Nigerian individuals with bank accounts, mobile money use is associated with a 2.3 percentage points decrease in the likelihood of entrepreneurship for men and women. This finding may reflect that men rely on other forms of formal finance aside from mobile money. Mobile money may primarily be used for personal financial need, while bank accounts are more commonly used for business purposes. Women are 7.2 percentage points more likely to become entrepreneurs compared to men. There is still no additional effect of mobile money on the likelihood of entrepreneurship for women compared to men. Mobile money use does not offer additional entrepreneurial benefits for women in Nigeria, regardless of their financial or technological access.

In column (3), Kenyan men without bank accounts experience a 4.3 percentage point increase in the likelihood of entrepreneurship if they use mobile money. The difference in the likelihood of entrepreneurship between women and men is 1.5 percentage points. The additional effect of mobile money for women becomes 3.0 percentage points compared to men using mobile money.

However, among those with bank accounts in Kenya, Column (4) suggests that while mobile money use remains strongly associated with the likelihood of entrepreneurship for men at 5.5 percentage points, the additional effect of mobile money for women becomes negative and insignificant. This may indicate that once women gain access to formal financial services, mobile money no longer provides a distinct advantage.

The results align with earlier findings that mobile money adoption in Nigeria is both limited and uneven, often confined to higher educated, urban individuals who are already

connected to formal financial systems. In Kenya, the findings across individuals with and without phone access or bank accounts align with the proposed mechanisms that mobile money enhances women's access to finance and protects their resources from household demands. These mechanisms may not apply in the Nigerian context, as mobile money use shows no additional effect on the likelihood of entrepreneurship. Mobile money and bank accounts seem to be complementary tools for entrepreneurship in Kenya, whereas they are substitutes in Nigeria. However, dividing the sample into these subgroups substantially reduces the number of observations which makes it more difficult to detect statistically significant effects.

5 Conclusion

This thesis examined the effect of mobile money use on the likelihood of women becoming entrepreneurs in Sub-Saharan Africa. The findings align with the guiding hypothesis and existing literature, showing that mobile money use increases the probability of female entrepreneurship. It supports the proposed mechanisms that mobile money helps female entrepreneurs by either improving access to credit or reducing intrahousehold pressure to divert business resources toward other household needs. By leveraging data from the FinScope Consumer and FinAccess Surveys and applying a linear probability model, this study contributes to the growing body of research on female entrepreneurship and digital financial inclusion in developing economies. The results suggest that women gain an additional entrepreneurial advantage from mobile money use compared to men. These findings are consistent with Kedir and Kouame (Kedir and Kouame 2022), who also document the gendered benefits of mobile money. More generally, mobile money users are more likely to be entrepreneurs than non-users across the sample.

However, results vary by country. In Nigeria, mobile money use has no significant association with male entrepreneurship, but it does provide a positive and significant effect

for women. Kenya's results differ where men who use mobile money are significantly more likely to become entrepreneurs than male non-users, but women continue to experience an additional benefit from mobile money use like in Nigeria. This highlights the particular importance of mobile money in contexts where women face stronger household demands or limited access to traditional finance.

The analysis also revealed cross-country differences in mobile money adoption rates. Two hypotheses were proposed to explain these patterns: mobile phone penetration and bank account penetration. In countries like Kenya, Ghana, and Zimbabwe, mobile money appears to act as a substitute for traditional banking, with adoption rates surpassing bank account ownership. In contrast, countries like Mauritius, which exhibit high bank account penetration, show relatively low mobile money adoption despite high mobile phone penetration. Nigeria stands out. Although mobile phone access is high and bank penetration remains moderate, mobile money adoption remains low. A deeper examination of Nigeria revealed that mobile phone and bank penetration have both steadily increased over time. Comparing this to Kenya, where mobile phone access rises while bank penetration declines, suggests that Nigeria's financial inclusion strategy may be more focused on strengthening the traditional banking system rather than expanding mobile money services. This indicates that in Nigeria, women may not be using mobile money for entrepreneurship, but are instead engaging with traditional banking services to meet their business needs.

Overall, these findings underscore the critical role of digital finance in supporting women's economic participation. Future research should explore the long-term impacts of mobile money on female entrepreneurs, focusing not only on business formation but also on sustainability, growth trajectories, and transitions into the formal economy.

6 Appendix

Table 10: Linear Probability Regression: Male Sample

	(1)	(2)	(3)	(4)	(5)
Mobile Money Use	-0.106***	0.064***	0.060***	0.051***	0.017***
	(0.0030)	(0.0042)	(0.0042)	(0.0043)	(0.0044)
Some Education				0.040***	0.019***
				(0.0042)	(0.0043)
Higher Education				-0.042***	-0.088***
				(0.0054)	(0.0057)
Divorced/Separated				-0.011*	-0.004
				(0.0065)	(0.0065)
Widowed/Single				-0.079***	-0.067***
				(0.0035)	(0.0035)
Household Head Status				0.066***	0.057***
				(0.0037)	(0.0037)
Age				-0.002***	-0.002***
				(0.0001)	(0.0001)
Age^2				0.000***	0.000***
				(0.0000)	(0.0000)
House Ownership Status				-0.048***	-0.044***
				(0.0033)	(0.0033)
Urban				0.013***	0.008**
				(0.0032)	(0.0032)
Mobile Phone Access					0.066***
					(0.0042)
Bank Account Ownership					0.023***
					(0.0035)
Saves Money					0.088***
					(0.0030)
Area FE	No	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
Constant	0.304***	0.127***	0.104***	0.189***	0.135***
	(0.0017)	(0.0279)	(0.0290)	(0.0293)	(0.0294)
Observations	100279	100279	100279	98362	98359
R^2	0.013	0.090	0.107	0.123	0.135

Standard Error in parentheses Age excludes 2022 survey from Zimbabwe
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 11: Linear Probability Regression: Female Sample

	(1)	(2)	(3)	(4)	(5)
Mobile Money Use	-0.090***	0.083***	0.083***	0.070***	0.019***
	(0.0031)	(0.0043)	(0.0043)	(0.0044)	(0.0045)
Some Education				0.064***	0.034***
				(0.0040)	(0.0040)
Higher Education				-0.045***	-0.122***
				(0.0059)	(0.0062)
Divorced/Separated				0.021***	0.030***
				(0.0058)	(0.0057)
Widowed/Single				-0.115***	-0.096***
				(0.0032)	(0.0032)
Household Head Status				0.052***	0.044***
				(0.0035)	(0.0035)
Age				0.001***	0.001***
				(0.0001)	(0.0001)
Age^2				-0.000***	-0.000***
				(0.0000)	(0.0000)
House Ownership Status				-0.044***	-0.039***
				(0.0033)	(0.0032)
Urban				0.003	-0.006*
				(0.0031)	(0.0031)
Mobile Phone Access					0.076***
					(0.0039)
Bank Account Ownership					0.049***
					(0.0037)
Saves Money					0.134***
					(0.0029)
Area FE	No	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
Constant	0.326***	0.079**	0.018	0.033	-0.020
	(0.0017)	(0.0335)	(0.0344)	(0.0344)	(0.0340)
Observations	103247	103247	103247	100889	100883
R^2	0.008	0.117	0.127	0.148	0.174

Standard Error in parentheses Age excludes 2022 survey from Zimbabwe
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 12: Linear Probability Regression: Age Group

	(1)	(2)	(3)	(4)	(5)
Mobile Money Use	-0.106***	0.062***	0.058***	0.017***	-0.011***
	(0.0030)	(0.0036)	(0.0037)	(0.0037)	(0.0037)
Female	0.023***	0.021***	0.018***	0.026***	0.036***
	(0.0024)	(0.0023)	(0.0023)	(0.0025)	(0.0025)
MM Use × Female	0.016***	0.022***	0.025***	0.025***	0.015***
	(0.0043)	(0.0041)	(0.0041)	(0.0041)	(0.0041)
Some Education				0.056***	0.033***
				(0.0028)	(0.0029)
Higher Education				-0.055***	-0.105***
				(0.0039)	(0.0041)
Divorced/separated				0.017***	0.023***
				(0.0042)	(0.0042)
Widowed/Single				-0.033***	-0.026***
				(0.0023)	(0.0023)
18-24				0.133***	0.102***
				(0.0056)	(0.0056)
25-35				0.250***	0.209***
				(0.0057)	(0.0057)
36-44				0.257***	0.215***
				(0.0061)	(0.0061)
45-60				0.222***	0.184***
				(0.0061)	(0.0061)
Above 60				0.115***	0.091***
				(0.0064)	(0.0064)
Household Head Status				0.024***	0.019***
				(0.0023)	(0.0023)
Dwelling Status				-0.041***	-0.038***
				(0.0023)	(0.0022)
Urban				0.010***	0.005**
				(0.0022)	(0.0022)
Mobile Phone Access					0.065***
					(0.0028)
Bank Account Ownership					0.024***
					(0.0025)
Saves Money					0.104***
					(0.0021)
Area FE	No	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes
Constant	0.304***	0.098***	0.065***	-0.097***	-0.115***
	(0.0017)	(0.0216)	(0.0223)	(0.0225)	(0.0224)
Observations	203526	203526	203526	201723	201714
R^2	0.011	0.096	0.110	0.144	0.159

Standard Error in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 13: Linear Probability Regression on Nigeria

	(1)	(2)	(3)	(4)
Mobile Money Use	-0.002	-0.037***	-0.058***	-0.012
	(0.0092)	(0.0092)	(0.0091)	(0.0091)
Female	0.031***	0.022***	0.018***	0.045***
	(0.0030)	(0.0030)	(0.0030)	(0.0036)
MM Use × Female	0.064***	0.046***	0.037**	0.027*
	(0.0149)	(0.0147)	(0.0146)	(0.0144)
Some Education				0.059***
				(0.0043)
Higher Education				-0.066***
				(0.0056)
Divorced/Separated				0.017**
				(0.0067)
Widowed/Single				-0.113***
				(0.0034)
Household Head Status				0.075***
				(0.0038)
Age				-0.001***
				(0.0001)
Age^2				0.000***
				(0.0000)
House Ownership Status				-0.026***
				(0.0036)
Urban				0.038***
				(0.0036)
Area FE		Yes	Yes	Yes
Year FE			Yes	Yes
Constant	0.369***	0.325***	0.355***	0.340***
	(0.0022)	(0.0094)	(0.0098)	(0.0124)
Observations	108341	108341	108341	106811
R^2	0.001	0.029	0.050	0.073

Standard Error in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 14: Linear Probability Regression on Kenya

	(1)	(2)	(3)	(4)
Mobile Money Use	0.106***	0.109***	0.111***	0.053***
	(0.0056)	(0.0056)	(0.0056)	(0.0060)
Female	0.024***	0.015**	0.012*	0.017**
	(0.0068)	(0.0068)	(0.0068)	(0.0068)
MM Use × Female	0.011	0.017**	0.020***	0.025***
	(0.0077)	(0.0076)	(0.0076)	(0.0076)
Some Education				0.019***
				(0.0054)
Higher Education				-0.013*
				(0.0071)
Divorced/Separated				0.001
				(0.0064)
Widowed/Single				-0.042***
				(0.0038)
Household Head Status				0.014***
				(0.0037)
Age				0.008***
				(0.0005)
Age^2				-0.000***
				(0.0000)
House Ownership Status				-0.059***
				(0.0045)
Sector				-0.060***
				(0.0041)
Area FE		Yes	Yes	Yes
Year FE			Yes	Yes
Constant	0.055***	0.020	0.066***	0.041**
	(0.0051)	(0.0125)	(0.0131)	(0.0175)
Observations	51560	51560	51560	51469
R^2	0.017	0.040	0.043	0.071

Standard Error in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

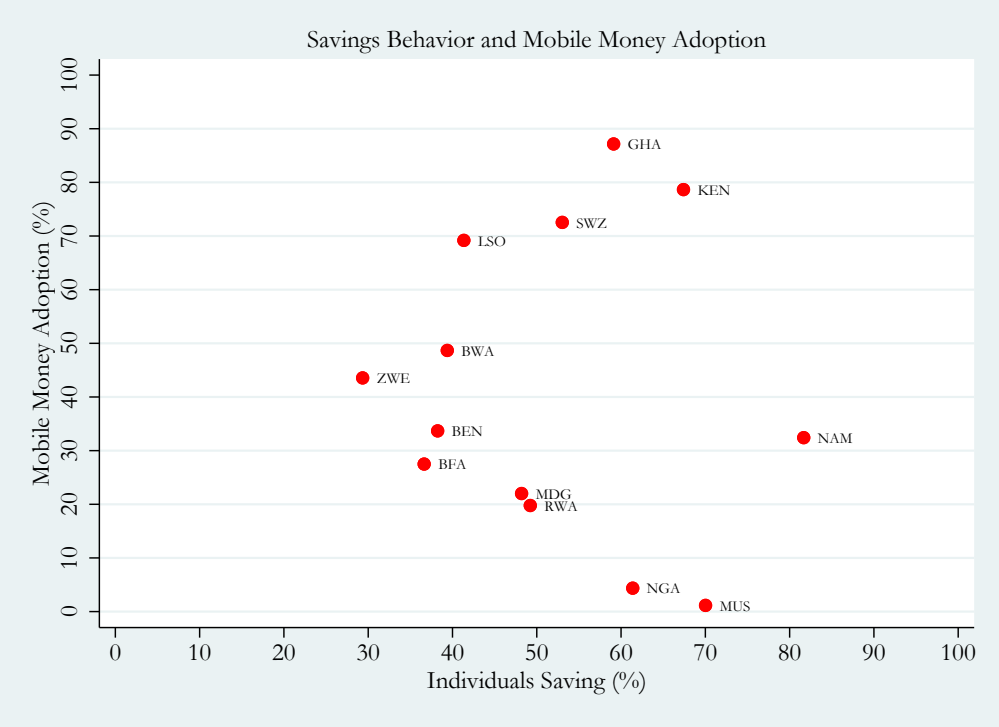

Figure 10: Savings Behavior Vs. Mobile Money Usage Across Countries

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