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The micro determinants of financial inclusion and financial resilience in Africa

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Abstract

This study analyzes the factors influencing financial inclusion and financial resilience in Africa. Using national surveys of 40 African countries and the doing business database, multiple models are performed to analyze financial inclusion drivers. The results show that individual characteristics, barriers to formal accounting, financial literacy and innovation condition the decision to have a traditional or mobile account. Informal savings are common among women, youth and in rural areas while formal savings predominate among men, the elderly and in urban areas. A high level of education and income leads people to migrate to formal savings. For business purposes, informal savings are preferred while for old age, individuals resort to formal savings because of interest rates. Social lifestyles make informal credit predominate in Africa. However, when people have employment, high income or education, they turn more to formal credit to preserve their reputation because of the respect and popularity they enjoy in their community. Marriage, financial literacy and innovation improve the resilience of individuals, while employment increases their vulnerability. Key policy recommendations are to improve the banking sector, institutions, innovations and income-generating activities to attract women and reduce the gender gap.

KEYWORDS

financial inclusion, financial literacy, financial resilience, innovation, individual characteristics

1 | INTRODUCTION

Despite the progress made over the past five years, finance remains less developed in Africa compared with the rest of the world. According to 2020 World Bank statistics, the bank penetration rate was 34.6% in sub-Saharan Africa compared with 70% in developing countries, and 94% in developed countries. Furthermore, the stylized facts show heterogeneity between regions and within countries. For instance, at a regional level, data from the Central Bank of West African States (2020), Bank of Central African States (2020) and African Development Bank (2020) show that the levels of banking penetration are respectively 19% in West Africa, 15% in Central Africa, 35% in East Africa, 70% in Southern Africa and 40% in North Africa. Although these rates are relatively low, the overall use of financial services is booming with 60.1% in the West African Economic and Monetary Union and other regions ranging from 70 to 95%,

except in the Economic and Monetary Community of Central Africa. This growth is linked to the progress of electronic money and mobile money services across the continent. This helped to greatly improve the financial inclusion of areas such as the West African Economic and Monetary Union to 49.9% in 2019.

At the country level, there is a huge gap between the top five countries (South Africa, Egypt, Morocco, Nigeria and Kenya) that have an impressive performance and the rest of Africa. From 2010 to 2020, the landscape of the most powerful African banks was dominated by Standard Bank, Nedbank, FirstRand, National Bank of Egypt, Banque Misr, ABSA, CIB Egypt, Attijariwafa Bank and Zenith, with an average of \$9 billion of capital (The Banker database, 2020). This banking growth has enabled 90% of adult South Africans to be financially included. Although 80% of adults in 2020 had a bank account, very few South Africans carry out transactions in the form of savings, loans or insurance. Even though Egypt ranks second on the continent, only 38% of the Egyptian population has a bank account, with 4% holding a credit card in 2020. Financial transactions using mobile phone are carried out by only 21%. Nigeria also improved financial inclusion to 64% in 2020 with 45% of Nigerian banking, suggesting that 36% of Nigerians are financially excluded. Only 51% in 2020 had access to formal financial services compared with 49% in 2018. This includes services such as pension accounts, mobile money, microfinance, banking and insurance.

These stylized facts evidence a contrast between the very low use of banking services in Africa and other financial services which are widely used. Although much research on financial inclusion has been conducted, the majority of recent works examine macroeconomic determinants (Ahamed & Mallick, 2019; Kanga et al., 2021; Kim et al., 2018; Neaime & Gaysset, 2018; Nkoa & Song, 2020; Omar & Inaba, 2020; Owen & Pereira, 2018). Macroeconomic factors are undoubtedly important in explaining financial inclusion, but they are only relevant if the individual has the required predisposition and necessary endowments to integrate into the financial and banking system. However, research on microeconomic determinants is rare (Dar & Ahmed, 2021; Ghosh & Vinod, 2017; Kumar et al., 2019) and the majority who investigate the individual characteristics of financial inclusion use the same variables, such as gender, education, income and age. However, financial products and services may simply not be available or accessible to individuals. Factors such as belief systems, customer needs, transaction costs, perception of financial institutions and financial literacy are motives that can affect financial inclusion in Africa. Consequently, this paper focuses on the individual and banking characteristics that influence financial inclusion.

Recently, although new banks are emerging and the number of customers is increasing, the rate is nevertheless lower than that of the penetration of informal financial services and mobile phone transactions. Furthermore, in Africa, over 75% of bank accounts have no movement over an average period of six months. So what are the variables that really motivate or hinder financial inclusion (formal or informal)? A developing interest in understanding financial inclusion has become an attractive topic in the world for financial institutions, governments and policymakers. Many reasons justify the relevance of financial inclusion in Africa. Indeed, financial inclusion contributes to the reduction of poverty and inequalities (Kling et al., 2020), then improves financial and technological development (Allen et al., 2014; Tian & Kling, 2021), which creates favorable conditions for the proliferation of digital finance and financial intelligence. In 2021, 84% of the African population was either financially coping or financially vulnerable. The insurance penetration rate in Africa stood at 3%, very far from the global average of 7.5%. Nearly 92% of the African population was uninsured, comprising mainly the poor and most vulnerable in terms of education and health care.

The objective of this paper was to identify the micro determinants of financial inclusion in Africa. Using national surveys of 40 African countries and the doing business database, this study employs multiple models to analyze the key drivers of financial inclusion by comparing formal and mobile accounts, and analyzing loan-taking, saving and financial resilience behaviors. This study is a contribution to the literature on the determinants of financial inclusion in developing countries and explores new aspects in order to develop innovative policies for the different players. The rest of this paper is organized as follows. The next section reviews the literature on the determinants of financial inclusion. Section 3 presents the data, the models used and the estimation procedures. Section 4 analyzes the results and discusses the main findings, and Section 5 concludes the study.

2 | LITERATURE REVIEW

2.1 | Theoretical literature

There are different approaches and often conflicting definitions of financial inclusion, but all theories agree that financial inclusion is the process that connects individuals to the financial system. This includes mainly the availability of financial products, and the accessibility of financial services for all segments of the population. The innovation in

the financial inclusion approach is that it places finance at the center of the economic and social development process. The most vulnerable and previously marginalized can take advantage of financial services to emancipate and empower themselves and become entrepreneurs. Schumpeter (1911) and Gurley and Shaw (1960), based on growth theory, are the precursors to underline the contribution of finance through resource allocation, savings mobilization and technological innovation. Kling et al. (2020) add a new theoretical consideration by linking financial inclusion and entrepreneurship through human capital to reduce inequalities.

Beyond that, a particular aspect must also be taken into account that is the use of financial services, because financial products may be available but not used by households owing to many barriers, especially in developing countries. This hidden dimension is deepened by the theoretical contributions of Wang and Guan (2017), Kumar et al. (2019) and Tian and Kling (2021), who emphasize that the determinants of financial inclusion can be demand or supply driven. The demand-side factors encompass socio-economic characteristics. In contrast, the supply-side factors include financial systems (financial innovation and technology), institutions and individual attitudes. Although the real causes of financial exclusion are not addressed, vulnerable people such as women, the young, the poor and the elderly are the most affected. There is therefore a need to investigate the key drivers of financial inclusion.

Several theoretical channels have also been identified through which financial inclusion builds financial resilience. Cole et al. (2017) argue that the use of financial services such as insurance, loans and savings accounts can encourage individuals to invest in health and education, and engage in high-risk activities with high potential returns, which is impossible for those who are financially excluded. Dupas and Robinson (2013) and Brune et al. (2016) add that using savings or credit in risk-mitigating activities such as business technologies or preventative health contributes to decreasing the negative impact in the event of a shock. Otherwise, savings and credit already represent an early form of resilience. However, even after the occurrence of a shock or incident, Jack and Suri (2014) and Dupas et al. (2017) point out that the most covered or the least at risk are those with insurance and savings, or with access to credit. Financial inclusion is therefore a coping strategy that increases resilience. More recently, Lee and Chen (2021), based on the framework of the resource-based view (RBV) theory, suggest that financial resilience is also linked to human resources, especially in the short term. More precisely, building up financial literacy decreases financial fragility through making good investments, planning for retirement and smoothing consumption. There is therefore a positive association between financial resilience and financial literacy.

2.2 | Empirical literature

Across the literature, there is no consensus on the determinants of financial inclusion. For instance, using the 2014 database on 37 African countries with probit estimations, Zins and Weill (2016) found that being a man, richer, more educated and older enables financial inclusion, with a higher influence of income and education. Soumaré et al. (2016), Koloma (2021) and Senou and Manda (2022), focusing on Central and West Africa and using the endogenous switching regression technique, propensity score matching and logit estimations, showed that age, gender, residence area, income, education, employment, marital status, household size, having one family member with a bank account and a degree of trust in financial institutions were driving financial inclusion. However, these results differ from one country to another. In some countries, loans, access to finance and savings have a positive and significant influence on youth entrepreneurship. The lack of money, the perception that saving is not necessary and the cost of financial services are barriers in Mali, while the lack of experience and bank branches are barriers in Benin.

Using the FinScope survey in Tanzania and Cameroon, Mndolwa and Alhassan (2020) and Ndoya and Tsala (2021) revealed that gender disparities in financial inclusion are higher in mobile money accounts, formal accounts and formal savings. While the over-dependence of women on men and income deepen the gender gap in access to financial services, education expands the gender gap in the use of financial services. Bongomin et al. (2018), using a logit model, added that social networks through social cohesion improved the level of financial inclusion in Uganda. Nevertheless, Naceur et al. (2017), investigating Islamic banking, showed that religion and cultural reasons lead to voluntary financial exclusion.

Regardless of recent developments, many researchers believe that financial literacy, financial innovation and financial technology are crucial for financial inclusion, especially in Africa. Grohmann et al. (2018), in a cross-country study, showed that higher financial literacy had a positive impact on financial inclusion across different income levels and several subgroups within countries. Kostov et al. (2015) focusing on South Africa with logistic regression and FinScope data, established that aspirations and financial literacy are significant determinants of households'

decision-making process. Amoah et al. (2020) examined the motivating factors that propel people to use mobile money in the Greater Accra Region of Ghana. Regressing a logit model on 733 households, they concluded that technology, available services such as phone credit recharge, education and income propel mobile money use in Ghana. Ouma et al. (2017) and Edo et al. (2019) assessed the relationship between internet, mobile phones, and financial inclusion in Africa. They found that mobile phone usage and internet improved individuals' access to basic financial services, and significantly increased both mobile banking and phone stored savings in sub-Saharan Africa.

Outside Africa, research also shows mixed findings. Fungáčová and Weill (2015), studying financial inclusion in China using probit regression, showed that the barriers to inclusiveness are poverty, cost, lack of trust in the banking system, a lack of documentation and distance. However, Kumar et al. (2019) and Dar and Ahmed (2021), with logistic regression, investigating households in India, clearly came to the conclusion that, although the availability of banking services contributed to formal service use, the impact is negligible compared with social norms, gender, employment status and income. Their results support our belief that demand barriers are more important than supply barriers. In this same dynamic, focusing on demand-side barriers, Ghosh and Vinod (2017) added that wages, education and gender explain more access while social and political factors explain more financial services use.

Finally, based on a survey done worldwide, Klapper and Lusardi (2020) supported the hypothesis that in both developing and developed countries, lower educated, poor adults and women lack financial knowledge and struggle with emergencies. Therefore, financial literacy, emerging innovations and technology diffusion depicted by ATMs, mobile systems, credit cards, lending platforms and cryptocurrencies positively improve financial behaviors and de facto financial resilience.

3 | METHODOLOGY

Following the theoretical review, the conceptual framework of this study is presented in Figure 1. We admit that financial inclusion, whatever its form (accessibility, availability, and use), depends on multiple parameters. These parameters are categorized into two groups—supply and demand side. The social environment, economic opportunities and family characteristics are the main factors in the decisions regarding the financial inclusion of the individual. Other factors such as financial literacy, the individual's attitude toward money and perception of the financial system also interfere with participation. Although demand-side factors are dominant, supply-side factors should also not be neglected. Indeed, if there is no bank branch or products adapted to the needs of consumers, the latter may have income and not take part in the financial system, hence the inclusion of supply factors. All of these parameters, while promoting financial inclusion, improve financial security and the financial behavior of individuals in terms of consumption, investment and risk-management. They then become more resilient.

To assess financial inclusion, three key indicators such as account ownership, saving and credit are used. The main determinants are individuals' characteristics (encompassing social, economic and family aspects), financial literacy and innovation. First, using account ownership, traditional (financial institution) and mobile account use are compared to

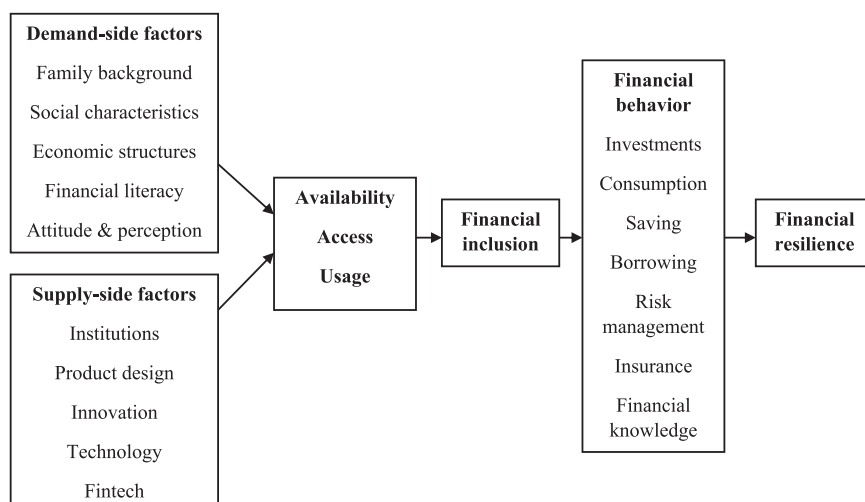


FIGURE 1 Conceptual framework.
Source: Authors.

determine the factors that motivate the choice of the type of account. Barrier perception is included among the main determinants to take into account some supply-side factors. Five key factors are used to measure barriers: (i) distance to financial institutions; (ii) cost of financial services; (iii) lack of documentation; (iv) lack of trust; and (v) religious reasons. Second, saving behavior is examined, comparing formal and informal saving. Saving motivation (to start a business and for old age) is included as a determinant of saving. Third, a borrowing indicator is used by comparing formal and informal credit. Loan-taking motivation (to purchase a home, for health purposes and to start a business) is also added as a determinant of credit. The financial resilience of individuals is analyzed by examining the financial sources of safety nets that individuals use in times of emergency. The main sources of emergency funds considered in this study are (i) savings, (ii) borrowing from a bank, employer, or private lender and (iii) selling assets.

This study uses data collected in 2018, 2019 and 2020 from national surveys of 40 African countries,¹ FinScope implementation and the doing business database. The survey includes at least 1000 people aged 15 years and above per country. Figure 2 provides an overview of the four most advanced countries in terms of financial inclusion, covering East, West, North and Southern Africa. Egypt has the lowest banking inclusion rate. Along with Nigeria, these two countries have the most financially excluded people (above 34%). In contrast, South Africa and Kenya are the only ones to achieve a formal financial inclusion rate exceeding 80%.

The main impediments to financial inclusion also differ between these countries (Figure 3). However, access (distance) and cost of banking services (interest rate, minimum amount, charges and fees), attitudes and perceptions (lack of trust, cash preference, corruption), and income seem to be common across countries. Institutions (bad experience, excessive documentation, belief system) also play a non-negligible role in South Africa and Nigeria, while lack of innovation (inability to read or write, technology gap, Islamic finance, transparency) is paramount in Kenya and product inadequacy in Egypt.

We also observe in Figure 4 that financial literacy is the driving force behind the level of banking inclusion in these countries. Although among the financially included the use of savings predominates (above 50%), in Nigeria, South Africa and Kenya, many people prefer having insurance schemes. Furthermore, South Africans and Egyptians profit enormously from credit.

Figure 5 shows that the resilience of individuals varies. In Kenya, only 48% admit to having faced a financial shock in the past 12 months. This rate reaches 70% in Egypt. Furthermore, along these vulnerable groups, 60% in Egypt against 78% in South Africa have experienced an episode of severe liquidity distress.

Since, the dependent variables are dummies, logistic and probit regression are recommended. However, probit models have been widely used in financial inclusion studies (Fungáčová & Weill, 2015; Zins & Weill, 2016). The logit model is estimated in this paper for three reasons. First, it is appropriate for a survey data while the probit model is suitable for experimental data. Second, despite the few studies using the logit regression, the first-order conditions are relatively simple to calculate, and the coefficients are easy to compute and interpret compared with probit, as stated by Maddala et al. (2001). Third, as depicted in the literature review, the distribution of residuals is asymptotic. The multinomial model is applied to identify the choice of account type (J), which is determined by: (i) individual characteristics such as age, gender, income level, education, marital status, employment and place of residence; (ii) the perception of barriers such as distance, transaction costs, documentation, trust and religion; and (iii) financial system implementation such as financial literacy and financial innovation.

The model is stated as follows:

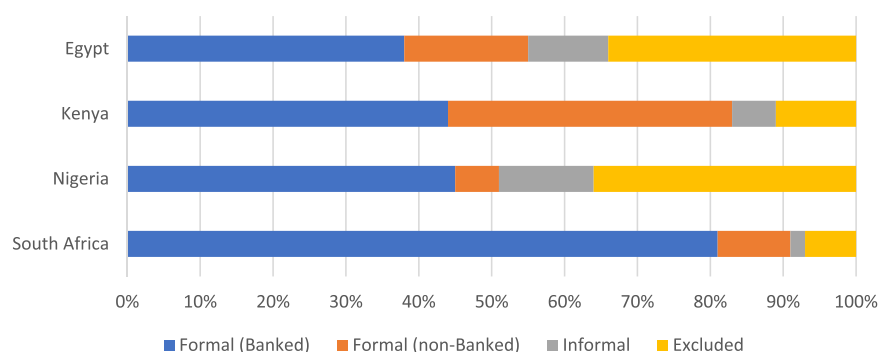


FIGURE 2 Financial inclusion of the four major countries. Source: Authors, using data from the national survey and FinScope data.

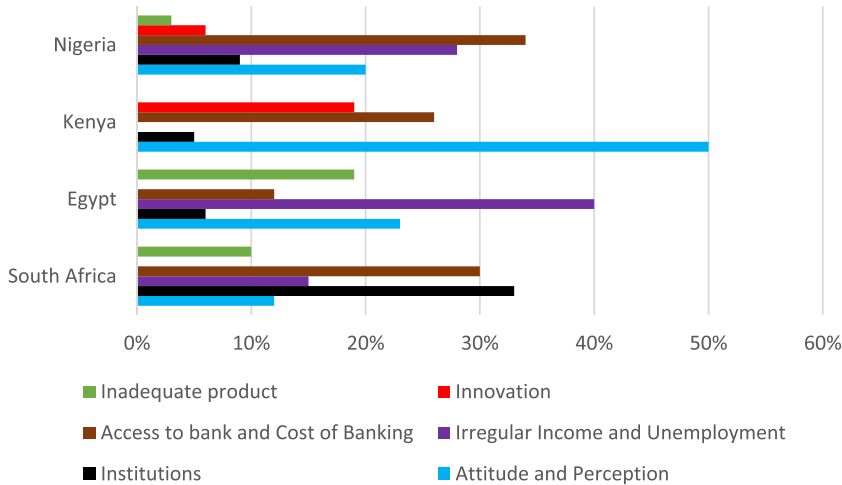


FIGURE 3 Barriers to financial inclusion in the four major countries. Source: Authors, using data from the national survey and FinScope data.

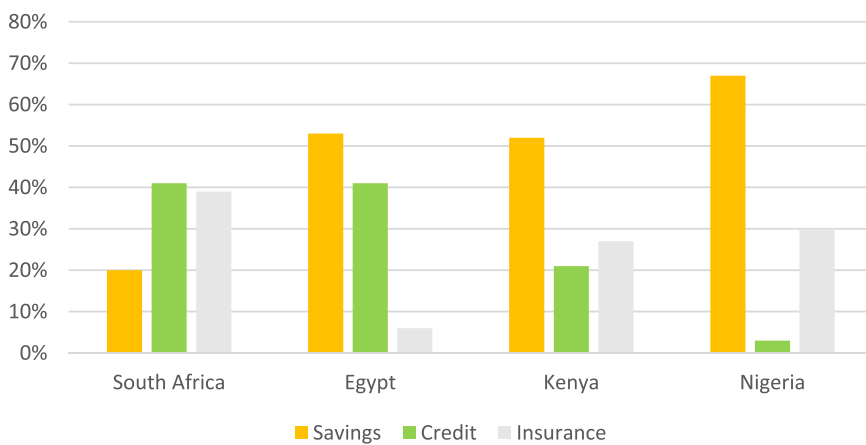


FIGURE 4 Use of financial products in the four major countries. Source: Authors, using data from the national survey and FinScope data.

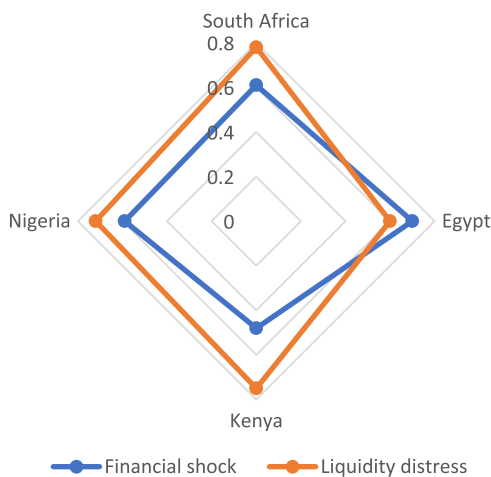


FIGURE 5 Financial resilience in the four major countries. Source: Authors, using data from the national survey and FinScope data.

$$P\left(\frac{j}{x_i}\right) = F(x_i \alpha_j), \tag{1}$$

where j (1,2) is the category or type of account, x_i the vector of the explanatory variables of the model and α_j the vector of parameters of category j .

$$P\left(\frac{j}{x_i}\right) = \frac{\exp(x_i \alpha_j)}{\sum_{k=1}^J \exp(x_i \alpha_k)}, \quad (2)$$

Assuming $J = 0$ represents the reference category and taking the logarithm:

$$\ln [P(j/x_i)/P(J/x_i)] = x_i \alpha_j. \quad (3)$$

The linear specification of the corresponding model is as follows:

$$Y(j/J) = \alpha_{0j} + \sum_{k=1}^7 \alpha_{kj} I_k + \sum_{s=1}^5 \alpha_{sj} B_s + \sum_{t=1}^2 \alpha_{tj} F_t + \varepsilon_j, \quad (4)$$

where I_k is the vector of individual characteristics, B_s the vector of the perception of barriers and F_t the vector of the implementation of the financial system.

Using the same argument, saving and loan-taking behaviors are analyzed through the following equations:

$$Y(c/C) = \alpha_{0c} + \sum_{k=1}^7 \alpha_{kc} I_k + \sum_{t=1}^2 \alpha_{tc} F_t + \sum_{g=1}^2 \alpha_{gc} M_g + \varepsilon_c, \quad (5)$$

where c (1,2) is the type of savings (formal, informal) and M_g the vector of saving motivation (business, old age).

$$Y(d/D) = \alpha_{0d} + \sum_{k=1}^7 \alpha_{kd} I_k + \sum_{t=1}^2 \alpha_{td} F_t + \sum_{h=1}^3 \alpha_{hd} L_h + \varepsilon_d, \quad (6)$$

where d (1,2) is the type of credit (formal, informal) and L_h the vector of loan-taking motivation (home purchase, health purposes, business).

A simple logit model is used to analyze financial resilience:

$$Y = \alpha_0 + \sum_{k=1}^7 \alpha_k I_k + \sum_{t=1}^2 \alpha_t F_t + \sum_{g=1}^3 \alpha_g R_g + \varepsilon, \quad (7)$$

where R_g is the vector of sources of emergency funds (savings, borrowing, selling assets).

The validity of all of the models is tested using *a-priori* expectations, which depend on the signs and magnitudes of the coefficients α of the variables under investigation. α measures the marginal effect, computed using the mean values of the dependent variables and deriving the conditional probability.

4 | EMPIRICAL RESULTS AND DISCUSSION

The descriptive statistics reported in Table 1 suggest that 45% of the respondents are female while 28.6% are in the top 50% income category. In addition, 29.3% of respondents have tertiary education and 40.5% are married. The data also highlight that 38.7% of individuals have employment and 22.4% live in urban areas. Analysis of the account ownership reveals that 35.3% of respondents have an account at a financial institution while 22.9% use a mobile account. Informal savings (31.7%) are used more than formal savings (13.6%) and 42.4% also resort to informal credit while about only 6.8% benefit from formal credit. Transaction costs (28.7%), documents (25.2%) and distance (23.1%) constitute the main constraints for the majority of respondents in accessing formal financial services. In addition, 46.3% of individuals are able to find income to overcome an emergency.

The results of the adequacy tests show that the Wald statistic is significant at 1%, which confirms the validity of the model. After performing the diagnostic tests, the marginal effects are displayed in Table 2. The results show that, in Africa, the probability of holding a traditional account (in a financial institution), increases with age, level of income and education. In addition, being married, having a job and living in urban areas increases the likelihood of having a traditional account. Furthermore, traditional accounts are more often used by men. Conversely, people who are younger, single and living in rural areas use mobile accounts more, that are much less restrictive and easier to access.

TABLE 1 Descriptive statistics of selected variables.

	Observations	Mean	Standard deviation
Individual characteristics			
Age (years)	41,000	35.89	5.433
Gender (female = 1; male = 0)	41,000	0.475	0.780
Income (upper 50% = 1; otherwise = 0)	41,000	0.286	0.439
Education (tertiary = 1; otherwise = 0)	41,000	0.293	0.457
Marital status (married = 1; otherwise = 0)	41,000	0.405	0.880
Employment (worker = 1; otherwise = 0)	41,000	0.387	0.449
Location (urban = 1; rural = 0)	41,000	0.224	0.463
Account ownership			
Financial institution account (yes = 1; no = 0)	41,000	0.353	0.478
Mobile account (yes = 1; no = 0)		0.229	0.420
Savings			
Informal saving (yes = 1; no = 0)	41,000	0.317	0.422
Formal saving (yes = 1; no = 0)		0.136	0.343
<i>Saving motivation</i>			
For business (yes = 1; no = 0)	41,000	0.188	0.391
For old age (yes = 1; no = 0)		0.114	0.317
Borrowing			
Formal credit (yes = 1; no = 0)	41,000	0.068	0.251
Informal credit (yes = 1; no = 0)		0.424	0.494
<i>Loan-taking motivation</i>			
To purchase a home (yes = 1; no = 0)	41,000	0.057	0.233
For health purposes (yes = 1; no = 0)		0.153	0.360
For business (yes = 1; no = 0)		0.099	0.299
Barriers			
Distance (km)	39,000	0.231	0.421
Transaction cost (Dollars)		0.287	0.452
Document requirement (yes = 1; no = 0)		0.252	0.434
Lack of trust (yes = 1; no = 0)		0.162	0.368
Religion (Muslim = 1; Christian = 0)		0.070	0.256
Financial resilience			
Possibility of coming up with emergency funds (yes = 1; no = 0)	40,000	0.463	0.499
<i>Sources of emergency funds</i>			
Savings (yes = 1; no = 0)	40,000	0.213	0.409
Borrowing from a bank, employer or private lender (yes = 1; no = 0)		0.038	0.190
Selling assets (yes = 1; no = 0)		0.077	0.266

Source: Authors' computation based on national survey and FinScope data.

TABLE 2 Multinomial logit results of financial inclusion determinants in Africa.

	Account		Saving		Borrowing	
	Traditional account	Mobile account	Formal saving	Informal saving	Formal credit	Informal credit
Female	-0.049*** (0.004)	0.034*** (0.003)	-0.023*** (0.003)	0.067*** (0.004)	-0.028*** (0.004)	0.025*** (0.011)
Age	0.027*** (0.003)	-0.015*** (0.002)	0.017*** (0.000)	-0.008*** (0.001)	0.055 (0.002)	0.216*** (0.012)
Age ²	0.001*** (0.000)	0.003*** (0.000)	0.008*** (0.000)	0.000*** (0.000)	0.004*** (0.000)	0.000*** (0.000)
Income	0.335***	0.012***	0.090***	0.016	0.028***	0.047
Upper 50%	(0.007)	(0.004)	(0.003)	(0.024)	(0.002)	(0.013)
Tertiary education	0.458*** (0.010)	0.014*** (0.007)	0.171*** (0.005)	0.013 (0.009)	0.051*** (0.004)	0.073 (0.027)
Married	0.222*** (0.006)	-0.128*** (0.002)	-0.224*** (0.005)	-0.073*** (0.007)	0.036*** (0.014)	0.025* (0.028)
Employment	0.136*** (0.004)	0.079*** (0.004)	0.187*** (0.004)	0.111*** (0.005)	0.085*** (0.007)	0.066 (0.015)
Urban	0.113** (0.005)	-0.098*** (0.008)	0.186*** (0.005)	-0.142*** (0.006)	0.028*** (0.005)	-0.029* (0.011)
Distance	-0.139*** (0.005)	0.092*** (0.007)				
Transaction cost	-0.089*** (0.003)	0.101*** (0.002)				
Document requirement	-0.038*** (0.007)	0.418*** (0.008)				
Lack of trust	-0.027*** (0.005)	0.023*** (0.001)				
Religion	-0.002*** (0.007)	0.037*** (0.005)				
Financial literacy	0.431*** (0.006)	0.140*** (0.005)	0.286*** (0.005)	-0.131*** (0.006)	-0.023*** (0.003)	0.014*** (0.012)
Financial innovation	0.207*** (0.005)	0.102*** (0.003)	0.078*** (0.005)	-0.015** (0.007)	0.031*** (0.004)	0.022** (0.005)
Saving for business			0.045 (0.004)	0.223*** (0.006)		
Saving for old age			0.057** (0.007)	0.025 (0.009)		
Loan-taking for home purchase					0.027*** (0.003)	0.87*** (0.001)

(Continues)

TABLE 2 (Continued)

	Account		Saving		Borrowing	
	Traditional account	Mobile account	Formal saving	Informal saving	Formal credit	Informal credit
Loan-taking for health purposes					0.025*** (0.002)	0.248*** (0.004)
Loan-taking for business					0.014*** (0.003)	0.147*** (0.004)
Constant	0.106*** (0.005)	0.150*** (0.007)	0.058*** (0.004)	0.090*** (0.008)	0.121*** (0.003)	0.137*** (0.005)
Observations	41,000		40,500		39,400	
Pseudo R ²	0.243	0.206	0.316	0.369	0.255	0.407
Likelihood ratio	99.5***	101.4***	118.6***	126.2***	185***	194.8***
Log likelihood	-21,122.8	-19,166.23	-14,178.11	-18,980.17	-16,184.9	-20,108.6

Note: Robust standard errors are in parentheses.

* $p < .1$; ** $p < .05$; *** $p < .01$.

Source: Authors' computation based on national survey and FinScope data.

This probability is even higher for women. The predominance of traditional accounts among men (4.9%) and mobile accounts (3.4%) among women is explained by the various documents required by financial institutions, which are often difficult for women to obtain. They are therefore inclined to own a mobile account, which is much more accessible. These findings are supported by Ghosh and Vinod (2017) and Kumar et al. (2019) in India, Mndolwa and Alhassan (2020) in Tanzania, and Ndoya and Tsala (2021) in Cameroon, who highlighted that the women are excluded from formal account through wage discrimination and lack of education. Although in urban areas, women have more access owing to there being less discrimination, they prefer informal services. In addition, traditional accounts in rural areas are more the prerogative of men, for whom the jobs are intended. Therefore, the exclusion of woman is rooted in caste.

Some measures such as increasing the areas covered and easing access conditions can improve the rate of account opening at financial institutions. This strategy is particularly relevant as some factors such as distance to a financial institution (9.2%), transaction costs (10.1%) and the required documents (41.8%) drive Africans toward mobile accounts. Indeed, the results highlight that these factors, associated with lack of trust in institutions, negatively affect the ownership of traditional accounts, which is in line with Koloma (2021), who demonstrated that the lack of money was the key barrier to formal inclusion in Mali. Thus, financial institutions must promote proximity to improve the perception of potential clients about the services. Improving the quality of institutions is necessary, but more important is increasing the income level of the population through propelling income-generating activities. These aspects are also mentioned by Omar and Inaba (2020) and Nkoa and Song (2020), who recommended that the policymakers and government should give attention to institutional factors and focus on creating opportunities for disadvantaged segments. Similar to Naceur et al. (2017), our findings suggest that being a Muslim reduces the use of traditional accounts (-0.2%) in favor of mobile accounts (3.7%). The implementation of Islamic finance in some areas is needed to strengthen financial inclusion.

Financial literacy and innovation are significant determinants of inclusion. An increase in financial literacy and innovation results in a relatively higher increase in the use of traditional accounts (43.1 and 20.7%) than mobile accounts (14 and 10.2%). This implies that the population is sensitive to innovation in the financial system, and this motivates their membership. A recommendation for policymakers is to raise financial literacy to improve people's understanding of financial products, concepts and risks. Financial institutions can also contribute to this process by offering free services to customers. This result was corroborated by Tian and Kling (2021) and Kanga et al. (2021), who underlined that innovation and the diffusion of financial technology have transformed financial systems and accelerated digitalization and financial inclusion in high-income countries. Grohmann et al. (2018) also demonstrated the beneficial effect of financial literacy on inclusion in several countries, mainly emerging economies.

Regarding the characteristics of savings, the results show that in Africa, men (−2.3%) use formal savings to secure their money while women (6.7%) use informal savings more. Young people have a preference for informal savings; however as they get older, they migrate into the formal system. This is due to their low and irregular income. However, when people's income (9%) and education (17.1%) rise, they turn away from informal savings toward formal financial institutions, which are more secure and reliable. Moreover, marriage reduces all forms of savings while employment increases them. In both cases, the incidence is higher for formal savings (−22.4 and 18.7%). Not surprisingly, savings with formal financial institutions are higher in urban areas (18.6%), while in rural areas individuals use informal savings more. This is linked to the inaccessibility of banks and customs in rural areas within families. Financial literacy and innovation increase formal saving (28.6 and 7.8%), but decreases informal saving (−13.1 and −1.5%). For business purposes, people prefer informal savings while for old age they resort to formal savings. One of the reasons for this behavior is the interest rate from which savers can benefit.

Credit behaviors are similar to saving behaviors. However, informal credit increases with age. This is linked to growing needs and social lifestyles in Africa where formal credit remains the last alternative mainly owing to repayment conditions. We found that the level of income, education and employment are significant factors that discourage the use of informal credit. Indeed, in many countries, obtaining a job, having a high income and education raise the status of the individual within the community. This prestige prevents the individual from resorting to any form of informal credit, which could damage their reputation. As a result, these factors stimulate the adoption of formal credit despite being denigrated. In addition, marriage and financial innovation increase all forms of credit. Informal credit is dominant in rural areas while formal credit is predominant in urban areas. Financial literacy decreases borrowing from financial institutions while it increases informal borrowing, which may be due to interest rate costs. Both forms of credit increase regardless of the reason for borrowing (for home purchase, business or health purposes). However, the impact on informal credit is the greatest, confirming the predominance of the informal sector in Africa. These features of credit are also stated by Edo et al. (2019) and Senou and Manda (2022), who estimated that

TABLE 3 Logit results of financial resilience determinants in Africa.

	Financial resilience
Female	−0.122*** (0.007)
Age	0.029*** (0.004)
Age ²	0.002*** (0.000)
Income upper 50%	0.398*** (0.001)
Tertiary education	0.233*** (0.017)
Married	0.158*** (0.010)
Employment	−0.076 (0.003)
Urban	0.050*** (0.008)
Financial literacy	0.317*** (0.015)
Financial innovation	0.263*** (0.003)
Saving	0.216*** (0.005)
Borrowing	−0.089*** (0.007)
Selling asset	0.108*** (0.011)
Constant	0.102*** (0.000)
Observations	40,000
Pseudo R ²	0.458
Likelihood ratio	139.7***
Log likelihood	−15,592.68

Note: Robust standard errors are in the parentheses.

* $p < .1$; ** $p < .05$; *** $p < .01$.

Source: Authors' computation based on national survey and FinScope data.

access to the internet, experience, a strong financial system and savings drive formal transactions. A major recommendation is to prioritize innovation and expand banking branches to satisfy customers.

Table 3 examines how people manage to overcome an emergency. The findings highlight that women (−12.2%) are less able to face an emergency, which suggests that women are financially less resilient in Africa. The reason for this is that women are very dependent on men in Africa. However, with age, resilience increases (2.9%). Being more educated (23.3%), married (15.8%) and having a high income (39.8%) also raise financial resilience. Although marriage is characterized by an increase in responsibilities and burdens, it increases the financial sustainability of the couple. In Africa, marriage allows couples to benefit from help and support from close family and the community. These transfers linked to social integration, although not regular, help to mitigate the occurrence of a possible shock, which strengthens financial resilience. In contrast, employment increases the vulnerability of the individual (−7.6%). One explanation for this phenomenon is that employment increases the burdens on the individual, who must now face the needs of the large family and his community. Living in urban area (5%), being financially literate (31.7%) and innovation (26.3%) improve the resilience of individuals. Indeed, urban areas offer more opportunity to generate income than rural areas. Therefore, financial literacy determines an individual's strength of resilience. Saving and selling assets to face an emergency improve financial resilience while borrowing money decreases it. Klapper and Lusardi (2020) and Lee and Chen (2021) found similar results in the United States. They revealed that financial inclusion is insufficient for financial resilience, which requires above all savings, risk management and financial literacy.

As a recommendation, saving or holding assets is the best source of financial resilience in Africa. Marriage (social capital) and human capital are also important factors that strengthen the financial capacity of the individual. It is also necessary to improve living conditions in rural areas, through increased infrastructure, the availability of public services and basic technologies to stimulate economic activities and create more opportunity for employment and income growth.

5 | CONCLUSION AND RECOMMENDATIONS

Financial inclusion is a fundamental step in the development process and limited access to finance can be a huge handicap for the African population if the right policies are not considered. Culture and religion, economic and social policies, and structural factors affect the decision of financial inclusion. Although financial inclusion has microeconomic and macroeconomic determinants, this study focuses on the individual characteristics of financial inclusion and financial resilience in Africa. Using national surveys of 40 African countries and the doing business database, this study uses logit and multinomial logit models to analyze the key drivers of financial inclusion by comparing formal accounts and mobile accounts and analyzing loan-taking, saving and financial resilience behaviors. The key findings show that individual characteristics matter in choosing the type of account. Being in a rural area, single and young drives people more toward mobile accounts that are much less restrictive and easy to access. Having an account at a financial institution is much more accessible to older people, employed, with income and education. This type of account is difficult to access because of a lack of documentation, a lack of trust, distance from the institution and transaction costs, moving people toward mobile accounts. In addition, being a Muslim reduces the use of traditional accounts in favor of mobile accounts. Financial literacy and innovation are also significant determinants of inclusion.

Regarding the characteristics of savings, as their income and education increase, people turn away from informal savings toward formal savings, which are more secure and reliable. Marriage reduces all forms of savings while employment increases them. Financial literacy and innovation increase formal saving while informal saving decreases. Furthermore, depending on the motivation, the choice of saving type depends on the motivation. Credit behaviors are similar to saving. However, the social lifestyles in Africa play a crucial role. Although marriage is characterized by an increase in responsibilities and burdens, it increases financial resilience. In contrast, because of the structure of African society, employment increases the social vulnerability of the individual.

The main policy recommendation of this paper is that policy such as gender policy needs to be implemented to reduce the gap between men and women's access to formal finance. For instance, financial institutions can reduce the documents required for women or offer them other forms of services. Financial inclusion also requires an improvement of the banking sector, which must expand bank branches and increase innovation. Transactions with mobile phones are developing and gaining more importance in Africa because of their ease. This system represents an immense

opportunity and potential that must be explored. Policies must create favorable conditions to exploit the potential of informal finance by regulating and implementing the rules.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

ENDNOTE

¹ List of countries: Algeria, Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Chad, Congo Democratic Republic, Congo Republic, Côte d'Ivoire, Egypt, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, South Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe.

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