Région et Développement
n° 56-2022
www.regionetdeveloppement.org

State fragility and the determinants of women's financial inclusion in sub-Saharan Africa

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Abstract - The aim of this paper is to analyze the role of the fragility of African states on the individual determinants of women's financial inclusion. To this end, we use microeconomic data on 35 sub-Saharan African countries in 2017. Using a probit specification and a Heckman selection model, we show that the probability of being financially included is lower among women and in the most fragile states. The results also highlight the differentiated incidence of women's individual characteristics on their financial inclusion in the most fragile states. Indeed, on the one hand, youth, poverty and the lack of mobile phones are the discriminating factors for women to have an account and build up savings. On the other hand, women's individual characteristics do not explain the likelihood of making online payments in fragile states. Therefore, the effectiveness of policies to promote inclusion should vary according to the type of financial service and the level of state fragility.

JEL Classification
G21, J16, O16, O55

Key-words
Financial inclusion
Fragile states
Gender
Sub-Saharan Africa

The authors thank the anonymous referees for their comments which helped greatly in improving the final draft of the article.

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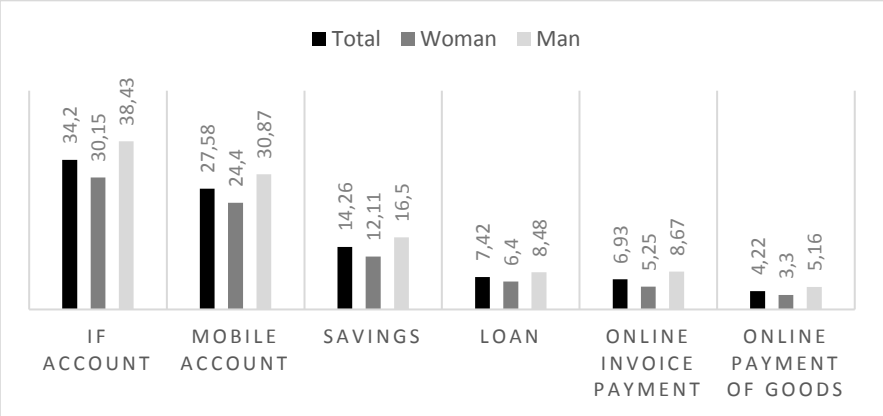
INTRODUCTION

Access to formal financial services is of paramount importance because of its utility and the diverse effects it can have on its beneficiaries. Thus, financial inclusion can be defined as a situation in which individuals and enterprises have the opportunity to access and the ability to use a variety of appropriate financial services, which are provided in a responsible and sustainable manner by a formal financial institution (CGAP, 2015). Financial inclusion benefits the poor by providing them with opportunities to make investments, to have an account and access to credit through a formal financial institution and finally to increase their income and the possibility of finding a job (Bruhn and love, 2014). Macroeconomic studies have shown us that an economy grows faster if financial intermediation is deep (Demirguc-Kunt et al., 2013).

Despite the beneficial effects of financial inclusion on development, the financial sector does not seem to have taken sufficient account of all sections of the population. Indeed, most people in the world do not have access to formal financial services and only 30% of women have access to an account (Oumaa et al., 2017). The poorer the country, the more the least banked populations are found. According to the Global Findex database, 515 million adults worldwide opened an account with a financial institution or via a mobile phone banking provider between 2014 and 2017 (Demirgüc-Kunt et al., 2018). This means that 69 per cent of adults now have an account, up from 62 per cent in 2014 and 51 per cent in 2011. In high-income economies, 94 per cent of adults have an account, compared with 63 per cent in developing economies. However, access to financial services is unevenly distributed by gender. Women are still less likely than men to have an account. Globally, 72% of men and 65% of women have a formal account, representing a gap of 7 percentage points between men and women (Demirgüc-Kunt et al., 2018). The gender gap is similar (8 percentage points) in developing economies, with 67% of men but only 59% of women having an account.

Figure 1: Depth of financial inclusion in SSA (%)



Source: Authors, from Global Findex (2017).

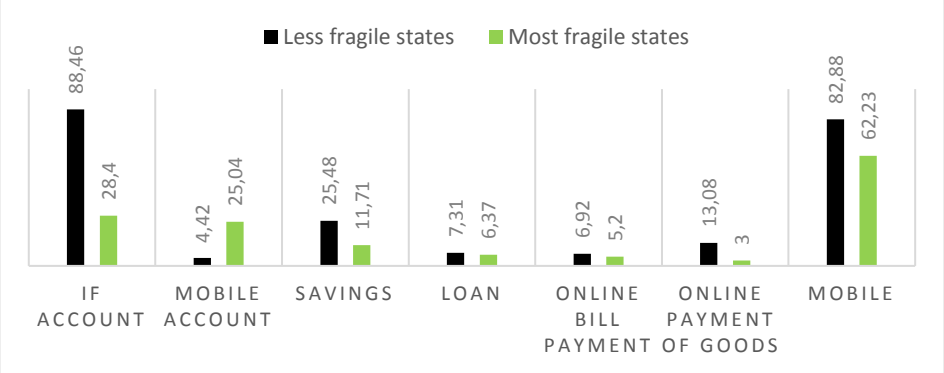
In Sub-Saharan African (SSA) countries, financial inclusion is very low. Indeed, as shown in Figure 1, only 34.2% of the individuals surveyed have an account in a formal financial institution (FI), 27.58% have a "mobile money" account, 14.26% make savings in a formal financial institution and 7.42% have made loans in a formal financial institution. In addition, 6.93% of individuals pay their bills via the internet,

compared to 4.22% who pay for products online. However, the gender discrimination against women is real regardless of the financial inclusion indicator chosen. The gap ranges from 1.86 percentage points for paying for products online to 8.28 percentage points for accessing an account in a formal financial institution.

The low financial inclusion of women in sub-Saharan Africa is a problem that can be exacerbated in the context of fragile states, especially as state fragility is a major obstacle to Africa's development. Four fragile out of every five states in the world are in Africa (ADB, 2013). According to the OECD (2013a), a fragile region or state has a weak capacity to perform basic governance functions and lacks the capacity to develop mutually constructive relationships with society. Fragile states are also more vulnerable to internal and external shocks such as economic crises or natural disasters. More resilient states demonstrate the capacity and legitimacy to govern a population and its territory. They can manage and adapt to changing social needs and expectations, changes in elite and other political arrangements, and growing institutional complexity. Similarly, the World Bank has adapted its approach to fragility to reflect multidimensional risks (World Bank, 2012). Typically, a fragile state faces (i) high risks arising from the interaction of internal pressures and external shocks; and (ii) limited capacity of the state and its institutions to mitigate the negative effects of these pressures and shocks (McKay and Thorbecke, 2019).

Figure 2 shows that women in the least fragile states are more financially included than women in the most fragile states. Furthermore, the gap is found to be very large for holding an account in a formal financial institution (60 percentage points), followed by saving (14 percentage points) and paying for products online (10 percentage points). However, the mobile money account ownership rate is higher among women in the most fragile states, with a gap of about 20 percentage points. This latter finding shows that the mobile money account is more accessible than an account in a formal financial institution, thus allowing women to catch up with institutional barriers. Moreover, the rate of mobile phone adoption among women is high regardless of the level of states fragility (82, 88% and 62.23% respectively for less and more fragile states).

Figure 2: Disparity in women's financial inclusion by level of state fragility in SSA (%)



Source: Authors, based on fund for peace and Global Findex (2017).

In this article, we analyze the determinants of low financial inclusion, particularly of women, and highlight the role of state fragility in sub-Saharan Africa. The existence of a significant gender gap is explained by lower financial literacy among women (Lusardi and Tufano, 2015), behavioral differences (Beck and Brown, 2011)

or even discrimination (Fletschner, 2009). The main contribution of this paper is to show that the explanation for women's low financial inclusion can vary depending on the level of fragility of the country where women reside. For this, we use micro-economic data on 35 countries in Sub-Saharan Africa in 2017. To account for selection bias in the variables explained, we use Heckman's method applied to a one-probit model.

The article adopts the following structure. The following section briefly presents the relevant literature. Section 3 describes the data and gives preliminary statistical results. Section 4 explains the empirical strategy used. The results are presented and discussed in section 5. The final section concludes the article.

1. LITERATURE REIEW

This section first presents the theoretical underpinnings of the influence of financial inclusion on development before showing the impact of gender on finance. Next, a brief empirical literature on gender concerns and financial inclusion will be presented.

1.1. Theoretical foundations

1.1.1. Finance and development

Development theory offers useful information regarding the impact of financial inclusion on economic development. Lack of access to finance can lead to inequality and poverty (Galor and Zeira, 1993; Aghion and Bolton, 1997). To illustrate this, Galor and Zeira (1993) show that financial market frictions prevent poor people from investing in education, creating a vicious circle of low income and low productivity, which in turn limits development. Similarly, the analytical work of Aghion and Bolton (1997) shows that the more capital is accumulated by the rich, the more funds are accessible to the poor for investment purposes.

Subsequent research has highlighted several ways in which financial inclusion can influence economic growth and development. First, consumers accessing the formal financial system may lead to increased overall savings. Any increase in savings can potentially increase the amount of resources that can be invested, which can have a positive impact on long-term economic growth (Aghion et al., 2009). Second, by increasing the surplus invested, financial inclusion is able to improve credit penetration, allowing financial institutions to diversify their loan portfolios. In addition, lending to previously financially excluded firms could also reduce the average credit risk of the loan portfolio, thereby improving the recyling of funds. The net effect is an overall increase in overall economic activity (Bayoumi and Melander, 2008). Third, higher levels of financial inclusion facilitate greater participation of different segments of the economy in the formal financial system. As the share of the formal financial sector increases, this argues for the use of the interest rate as the main policy tool, with implications for economic growth (Cecchetti and Kharroubi, 2012).

1.1.2. Gender and finance

Theoretically, it is possible to discern several ways of linking gender to finance. First, gender equality increases the stock of human capital (Klasen and Lamanna, 2008). A better-educated female workforce implies a greater accumulation of skills and expertise, and increases the overall demand for finance. In addition, better-educated women are likely to have fewer children and can devote more time to work. This not only risks lowering the dependency ratio and generating demgrapic dividends, but also improves their use of finance. A number of relatively recent studies

have examined this causal relationship. A second channel through which gender equality is important is through its impact on capacity building (Seguino and Floro 2003). By improving the skill set of the workforce, gender equality increases labour productivity and promotes investment. In addition to investment, improving women's income can increase domestic savings. This can increase women's propensity to enter the formal financial system. This may indicate a greater propensity for women to save, which may cause an increase in household savings if income is redistributed from men to women. More domestic savings can be channelled through the financial sector, making capital available to businesses. Third, gender equality can improve agricultural production. According to the Food and Agriculture Organization of the United Nations, improved access by women to agricultural resources can improve agricultural production on women's farms in developing countries by 4 per cent (FAO, 2011). Provided that women receive a share of their income, this is likely to give them the means to access the formal financial system.

1.2. Selective review of the empirical literature

Studies have shown that access to and use of financial services is not gender-neutral. There exist disparities between men and women, influenced by both demand-side and supply-side constraints. Demirgüç-Kunt et al (2013) show that, in the case of developing countries, women are more often excluded from using financial services and that the consequences of their financial exclusion are linked to inequality in income, education and employment. Using FinScope and FinAccess surveys undertaken during 2004–09 across nine sub-Saharan Africa countries, Aterido et al (2013) provided evidence to support the gender gap in the use of financial services. Specifically, the findings revealed that the lower use of formal financial services among women was explained by their lower levels of income, education, and employment status. On the other hand, women were found to be 5.8 per cent more likely on average to use informal financial services than men, and less likely to be excluded from informal financial services. The results of Fanta and Mutsonziwa (2016) are more nuanced. Indeed, in Southern Africa, Fanta and Mutsonziwa (2016) show that the gender gap prevails even in countries where financial inclusion is highest: the gender gap in bank account ownership is highest in Botswana, Swaziland and Mauritius, while South Africa is the only country with a positive gender gap, i.e. women are more financially included than men. They explain that this may be mainly motivated by women receiving social grants via the SASSA card.

The paper of Ndoya and Tsala (2021) analyses the drivers of the gender gap in financial inclusion in Cameroon, using Finscope 2017. The results of the decomposition show that there is a gap in all indicators of access to and use of financial products and services in favor of men. The results also show that the largest contributors to the gender gap in access to and use of financial products and services are income and education, depending of indicator of financial inclusion. Using the same type of data (Finscop 2017) but in Tanzania, Were et al. (2021) show that women (especially married women) are less likely to access mobile money services and banking financial services compared with men. Similarly, women are less likely to save and borrow compared with men, with a higher percentage opting to keep cash at home or save with a saving group. Were et al. (2021) show that these gender gaps are attributable to factors such as lack of income, limited financial literacy, and lack of access to smartphones and other digital facilities. The World Bank (2020) notes that while digital technology provided an armoury for the Covid-19 response in Tanzania, the affordability of smartphones, electricity connectivity, and transaction fees remained a hindrance to women's access and use.

Although the number of studies that examine demand-side factors by using financial inclusion survey databases is growing, few studies have delved into analyzing the role of state fragility on the determinants of women's financial inclusion, especially in sub-Saharan Africa. While Klugman and Quek (2018) explore the barriers of women's financial inclusion in the challenging context of fragility and conflict, their analysis is based on descriptive statistics and the binary approach to state fragility. Our study makes a contribution to the literature by focusing on SSA countries and using appropriate econometric estimates. Furthermore, we use a new approach defining the fragility of states. Indeed, unlike Klugman and Quek (2018) and others, we define the fragility as a continuum in which levels of fragility are found, rather than a fragile-non fragile dichotomy.

2. DATA

We use the World Bank's Global Findex 2017 database for financial inclusion and the Fund for Peace's Fragile States Index (FSI). The data used is on 35 countries in sub-Saharan Africa[1] for the year 2017. Global Findex financial services data was collected by Gallup, Inc. in conjunction with the annual Gallup World Poll. Gallup conducted a global survey of at least 1,000 people in 148 economies, using nationally representative, randomly selected samples[2]. The target population is the entire non-institutionalized civilian population, aged 15 years and older. Global Findex data are particularly well suited for measuring the gender gap in access to finance because the definition of account penetration includes only individual or joint accounts and not the use of someone else's account. The use of savings and credit also refers to individual behavior. This contrasts with other demand-side data on financial behavior that measure account penetration, savings behavior and credit use at the household level[3]. In contrast, indicators at the individual level allow us to directly measure women's control over their assets, an important component of economic empowerment. The Global Findex database provides a large number of indicators on financial inclusion to assess the degree of account penetration, use of financial services, goals and motivations, alternatives to formal financing, etc. The indicators are based on the Global Findex database, which provides a comprehensive set of indicators on financial inclusion. It also provides socio-demographic information: gender, age, income, education and employment. The Global Findex database only has binary job data (1 if the respondent has a job and 0 otherwise). Data on qualifications and work in the informal sector do not exist in this database. Presbitro et al. (2014), Chaudhuri et al. (2018) or Chundakkadan and Sasidharan (2021) use data from firms (not individuals) to show that female-led firms have less access to credit than male-led ones. Figure 1 shows the low depth of financial inclusion in the 35 SSA countries in our sample.

The FSI is constructed on the basis of 12 indicators composed of four social components (population pressures, refugees and internally displaced persons, group

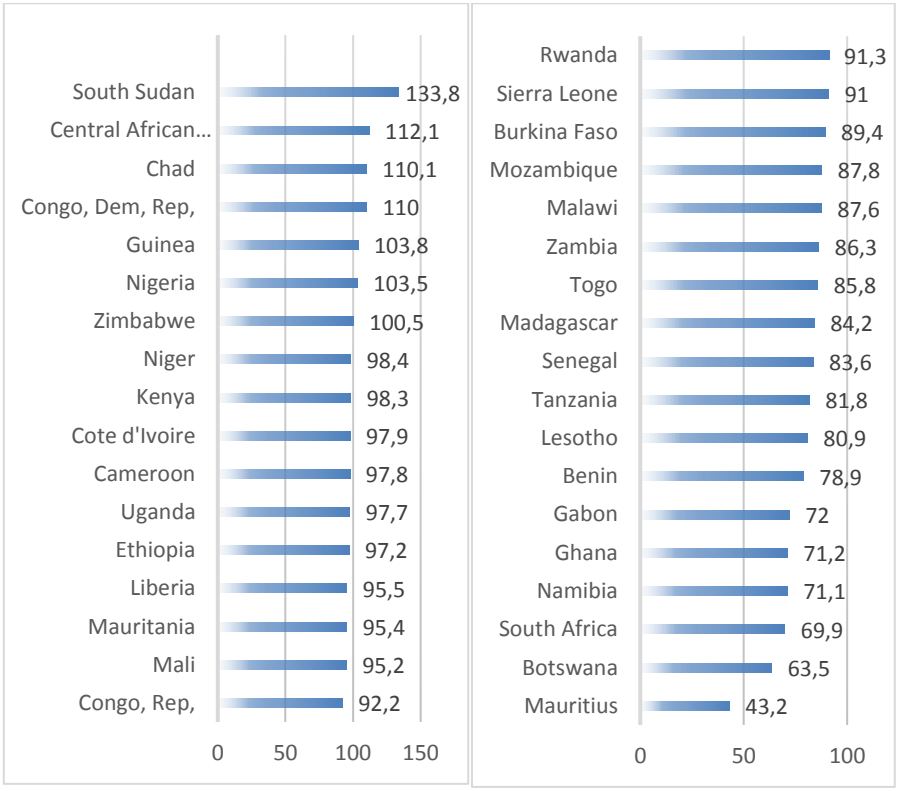
[1] Benin, Botswana, Burkina Faso, Cameroon, Central African Republic, Chad, Congo (Brazzaville), Democratic Republic of Congo, Côte d'Ivoire, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, South Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

[2] The complete database at the individual level, as well as detailed information at the national level on data collection dates, sample sizes, excluded populations and margins of error can be found at: www.worldbank.org/globalfindex.

[3] For example, the Life in Transition (LIT) survey of the European Bank for Reconstruction and Development (EBRD) includes the question: "Do you or any member of your household have a bank account?

grievances, human and brain drain); two economic indicators (unequal economic development and poverty and economic decline); and six political indicators (state legitimacy, public services, human rights and rule of law, security apparatus, fragmented elites and external intervention). Each of the 12 main components of the FSI is scored between 0 (best) and 10 (worst), with a higher number indicating a higher level of fragility. The scores of the 12 components are added together to obtain the composite index - so that the range of the FSI is from 0 to 120 (at least to most fragile)[4]. Figure 3 shows that all states are fragile, but at different levels. The least fragile states are Mauritius, Botswana, South Africa, Namibia and Gabon, while the most fragile are South Sudan, Central African Republic, Chad, Democratic Republic of Congo and Guinea.

Figure 3: Frequency distribution of fragile state indices in SSA (2016)



Note: The higher the index, the more fragile the state.
Source: Authors, from Fund for Peace website: http://fsi.fundforpeace.org/.

Variable definitions and descriptive statistics are presented in Table 1. The correlation matrix is contained in Table 2. The correlation coefficients in particular show a negative relationship between financial inclusion and state fragility. In other words, the higher the state fragility, the lower the access to and use of financial services.

[4] McKay and Thorbecke (2019) provides a good, more detailed discussion of their indicators. See also Hoffler and Nkurunziza (2019) and Hoffler (2019) for a good clarification of the concept of "state fragility".

Table 1: Descriptive statistics

Variables	Definition	Obs.	Mean	Std. Dev.	Min	Max
WOMAN	1 if the respondent is a woman and 0 otherwise	35000	0.510	0.499	0	1
AGE	Age of respondent	34800	34.032	15.267	15	99
AGE2	Age of respondent squared	34800	1391.326	1343.138	225	9801
EDUC	1 if the respondent has primary education; 2 if he or she has secondary education; 3 if he or she has higher education	34724	1.523	0.586	1	3
REV	5 levels of household income quintile: 1 if among the poorest 20% to 5 for the richest 20%.	35000	3.241	1.430	1	5
EMPL	1 if the respondent has a job and 0 otherwise	35000	0.693	0.460	0	1
MOBILE	1 if you have a mobile phone and 0 otherwise	34896	0.680	0.466	0	1
MOB_ACCOUNT	1 if you have a mobile money account and 0 otherwise	33000	0.275	0.446	0	1
E_PAIE	1 if payment of invoices or products online, 2 if payment of invoices and products online, and 0 if no payment online	33977	0.111	0.374	0	2
SAVINGS	1 if saving in a formal financial institution in the last 12 months and 0 otherwise	34536	0.142	0.349	0	1
CREDIT	1 if credit in a formal financial institution in the last 12 months and 0 otherwise	34538	0.074	0.2626	0	1
ACCOUNT_FI	1 if holding an account in a formal financial institution and 0 otherwise	35000	0.342	0.474	0	1
FSI	Fragility index (0 for less fragile to 120 for more fragile)	35000	89.682	14.665	43.2	113.8

Table 2: Correlation matrix

	ACCOUNT_FI	SAVINGS	CREDIT	E_PAIE	WOMAN	AGE	AGE2
ACCOUNT_FI	1.0000						
SAVINGS	0.4748	1.0000					
CREDIT	0.2460	0.2413	1.0000				
E_PAIE	0.2412	0.2540	0.1568	1.0000			
WOMAN	-0.0873	-0.0627	-0.0397	-0.0707	1.0000		
AGE	0.0548	-0.0024	0.0170	-0.0616	-0.0147	1.0000	
AGE2	0.0302	-0.0199	-0.0015	-0.0686	-0.0094	0.9725	1.0000
EDUC	0.3248	0.2297	0.1050	0.2075	-0.1310	-0.1884	-0.1951
REV	0.2162	0.1902	0.0871	0.1316	-0.1140	-0.0520	-0.0590
EMPL	0.1132	0.1082	0.0805	0.0672	-0.1352	-0.0308	-0.0721
MOBILE	0.2930	0.1809	0.0909	0.1348	-0.1154	-0.0338	-0.0638
MOB_ACCOUNT	0.2364	0.2014	0.1376	0.3052	-0.0724	-0.0839	-0.0983
FSI	-0.2745	-0.1144	-0.0460	-0.0986	-0.0468	-0.0896	-0.0855

	EDUC	REV	EMPL	MOBILE	MOB_ACCOUNT	FSI
EDUC	1.0000					
REV	0.2729	1.0000				
EMPL	0.0451	0.0617	1.0000			
MOBILE	0.3090	0.2109	0.0894	1.0000		
MOB_ACCOUNT	0.2219	0.1660	0.1299	0.2633	1.0000	
FSI	-0.1222	-0.0061	0.0519	-0.1542	-0.0187	1.0000

3. METHODOLOGY

To study gender differences in access to and use of finance, following previous research (Demirguc-Kunt et al., 2013, 2015; Zins and Weill, 2016; Ghosh and Vinod, 2017), we use a multivariate regression model in which we examine the impact of gender on financial inclusion, while controlling for other characteristics of the individual. Next, we estimate the impact of state fragility on women's financial inclusion and finally we analyse the role of fragility on the impact of the determinants of women's financial inclusion. As a result, the empirical models are as follows:

$$FI_i = \alpha_0 + \alpha_1 WOMAN_i + \alpha_2 FSI_c + \alpha_K X_i + \mu_{ic} \quad (1)$$

$$FI_{fi} = \beta_0 + \beta_1 X_{fi} + \beta_2 FSI_c + \varepsilon_{fic} \quad (2)$$

$$FI_{fi} = \delta_0 + \delta_1 X_{fi} + \delta_2 FSI_c + \delta_k X_{fi} * FSI_c + \gamma_{fic} \quad (3)$$

Where *FI* represents the different dimensions of financial inclusion (formal account, formal savings, formal credit and online payment); *WOMAN* represents the female gender; FSI_c is the fragile state index of the country *c*. *X is* the matrix of other variables that can explain financial inclusion (characteristics of the individual); *fi* represents female *i*. μ, ε and γ are the terms of error.

When access to a financial service is the dependent variable, we use a probit model, since the variables explained are binary. When the dependent variable is the use of the financial service (in this case the use of the account), we use a two-stage Heckman model. In the first step, the probit model (formal account) is estimated by the maximum likelihood method. Its estimation allows us to calculate the selection term σ_i. Then, in the second step, the utilization equation is estimated by the nonlinear least squares method or by the maximum likelihood method by including the correction term as an additional variable. The coefficient of this selection term captures the effect of the correlation of the error terms in the estimation of selection processes with that of account utilization. This estimation method then allows the selection bias to be corrected and unbiased coefficients to be obtained.

4. RESULTS

Table 3 presents the results of the estimates of the impact of individual characteristics and fragility of statements on the probability of using different financial products, while controlling for country fixed effects. Specifically, we analyze the adoption of four financial products or services: holding an account in a financial institution (ACCOUNT_FI), saving and credit with a financial institution (SAVINGS and CREDIT) and online payment (E_PAIE). Columns (1) to (4) present the results for the whole sample, while the results in columns (5) to (12) focus only on women. Marginal effects are presented in Table 4. The account holding and online payment models are estimated using a simple probit, while for the savings and credit models we use a probit with selection bias. The use of the probit with selection bias results from the fact that the probabilities of saving and borrowing are only observed for those who have an account. It is important to note that due to the cross-sectional nature of the data, we can only interpret these results as significant correlations between individual characteristics and measures of financial inclusion and not as causal relationships. To isolate these correlations from the potential association between inclusion measures and characteristics at the country level, the estimates take into account national fixed effects.

The overall sample estimate shows that women are less likely to have an account and make payments online. However, the results show that there are no gender differences in the use of services such as savings and credit. These results are not fully

consistent with the findings of Camara et al (2015) in Peru, Tuesta et al. (2015) in Argentina and Allen et al. (2016) globally. Indeed, for these authors, gender has no impact on the probability of using a financial service. Our results show that, unlike other regions of the world, women in sub-Saharan Africa have low financial inclusion compared to men, mainly for account ownership and online payments. Women's lower use of formal financial services can be explained by gender gaps in other dimensions of financial service use, such as their lower level of income and education, as well as their household and employment status (Aterido et al., 2013). These findings in SSA are consistent with those of Fanta and Mutsonziwa (2016) in Southern Africa, Özşuca (2019) in North Africa, Demirgüç-Kunt et al. (2013) in developing countries and Were et al. (2021) in Tanzania.

In addition, the results show that the four financial products meet a fairly similar person profile. Columns (1) to (4) show that the probability of accessing a financial product is higher among older (up to a certain threshold), wealthy, educated, employed and mobile phone owners. On the other hand, people living in countries with high levels of frailty have less access to an account and online payments. Yet they are more likely to save than those in less fragile states. However, the results suggest that the need for credit does not depend on the level of state fragility.

Columns (5) to (8) show that the likelihood of being financially included among women is higher for those who are older, better educated, wealthier, employed, have a telephone and mobile account and live in less fragile states. However, the negative impact of state fragility is only valid for the likelihood of having an account and making payments online. People with higher levels of education not only have higher levels of financial inclusion and higher levels of financial literacy, but also plan their spending and build a financial safety net (OECD, 2013b). Therefore, more educated women might consider different ways of obtaining financial resources through formal channels, such as financial institutions. Since there are differences in educational attainment among women, it is more than likely that a more educated woman is less financially excluded. To the extent that rich women are more likely to own assets, they are also more likely to be financially included than poor women. Since employment is strongly related to income, women in paid employment would therefore be more financially included than economically inactive women.

Columns (9) to (12) show the results containing the interactions between women's individual characteristics and state fragility. It appears that in more fragile states, the likelihood of owning an account and saving is lower among young, poor women and those without mobile accounts. Furthermore, in these countries, women with mobile phones are more likely to save and credit. Mobile banking is a means of providing financial services in fragile states characterized by infrastructure and mobility constraints. Mobile accounts can expand women's business options and increase their consumption. In Kenya, improved access to mobile money agents has given women more occupational choices, allowing some women to leave agriculture and start businesses (Suri and Jack, 2016). Mobile phones can be used to make payments linked to a bank account or a mobile-only account. Users can make deposits and withdraw money, among other services, through authorized agents working with the mobile money service provider (a well-known example is M-Pesa, operated by Vodafone in a number of countries).

However, individual characteristics do not explain women's likelihood of making online payments in fragile states. Also, education and employment are not discriminating factors in women's financial inclusion in fragile states. Although difficult to compare, these results contrast with those of Özşuca (2019) which showed that employment is the most important factor in explaining gender discrimination in financial inclusion in North Africa, mainly for savings and credit.

Table 3: Determinants of financial inclusion in Sub-Saharan Africa (probit)

	All								Women			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	ACCOUNT_FI	SAVINGS	CREDIT	E-PAIE	ACCOUNT_FI	SAVINGS	CREDIT	E-PAIE	ACCOUNT_FI	SAVINGS	CREDIT	E-PAIE
WOMAN	-0.0897***	0.00588	-0.0241	-0.170***								
	(0.0157)	(0.0189)	(0.0219)	(0.0228)								
AGE	0.0319***	0.00586*	0.0370***	0.00284	0.0271***	0.000346	0.0442***	-0.00242	-0.0252	-0.0701***	0.0582	-0.00208
	(0.00231)	(0.00323)	(0.00405)	(0.00407)	(0.00327)	(0.00451)	(0.00637)	(0.00583)	(0.0219)	(0.0248)	(0.0373)	(0.0332)
AGE2	-0.000254***	-9.6e-05***	-0.00042***	-0.00011**	-0.000217***	-2.75e-05	-0.00056***	-1.63e-05	0.000723***	0.000930***	-0.000535	-0.000229
	(2.64e-05)	(3.66e-05)	(4.74e-05)	(5.04e-05)	(3.73e-05)	(5.11e-05)	(7.85e-05)	(7.10e-05)	(0.000253)	(0.000296)	(0.000458)	(0.000405)
EDUC	0.572***	0.101***	0.0812***	0.354***	0.590***	0.119***	0.0134	0.396***	0.632***	0.712***	0.403**	0.406**
	(0.0144)	(0.0262)	(0.0296)	(0.0200)	(0.0214)	(0.0409)	(0.0465)	(0.0315)	(0.141)	(0.143)	(0.172)	(0.177)
REV	0.129***	0.0881***	0.0461***	0.0765***	0.124***	0.0995***	0.0474***	0.0898***	-0.0731	0.00796	0.0121	0.0221
	(0.00568)	(0.00852)	(0.00975)	(0.00857)	(0.00808)	(0.0124)	(0.0141)	(0.0129)	(0.0533)	(0.0616)	(0.0774)	(0.0739)
EMPL	0.302***	0.191***	0.225***	0.0953***	0.314***	0.199***	0.208***	0.172***	0.102	0.283*	0.267	0.246
	(0.0177)	(0.0245)	(0.0288)	(0.0267)	(0.0238)	(0.0341)	(0.0399)	(0.0379)	(0.151)	(0.169)	(0.218)	(0.211)
MOBILE	0.581***			0.190***	0.534***			0.142***	0.937***			0.215
	(0.0189)			(0.0328)	(0.0258)			(0.0473)	(0.184)			(0.317)
MOB_ACCOUNT				0.922***				0.903***				0.795***
				(0.0231)				(0.0355)				(0.208)
FSI	-0.0234***	0.00225**	0.00112	-0.0117***	-0.0250***	0.00103	0.00323*	-0.0126***	-0.0339***	-0.0411***	-0.0130	-0.0174**
	(0.000559)	(0.000966)	(0.00110)	(0.000762)	(0.000794)	(0.00154)	(0.00178)	(0.00117)	(0.00593)	(0.0119)	(0.0146)	(0.00796)
AGE*FSI									0.000621**	0.00104***	2.18e-05	-7.03e-06
									(0.000253)	(0.000308)	(0.000441)	(0.000383)
AGE2*FSI									-1.11e-05***	-1.29e-05***	-1.72e-06	2.61e-06
									(2.93e-06)	(3.69e-06)	(5.45e-06)	(4.66e-06)
EDUC*FSI									-0.000734	-0.00284	-0.00148	-0.000163
									(0.00160)	(0.00177)	(0.00210)	(0.00207)
REV*FSI									0.00217***	0.00201**	0.00111	0.000833
									(0.000610)	(0.000824)	(0.00101)	(0.000868)
EMPL*FSI									0.00234	0.00134	0.00120	-0.000913
									(0.00174)	(0.00210)	(0.00266)	(0.00249)
MOBILE*FSI									-0.00561***	0.00458***	0.00285**	-0.000895
									(0.00209)	(0.00107)	(0.00123)	(0.00362)
MOB_ACCOUNT*FSI									0.00456***	0.00532***	0.00579***	0.00124
									(0.000295)	(0.000881)	(0.00105)	(0.00243)
Country Fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Invmills		-0.834***	-0.361***			-0.781***	-0.374***			0.288	0.471	
		(0.0510)	(0.0551)			(0.0754)	(0.0814)			(0.262)	(0.309)	
Constant	-1.139***	-1.018***	-2.326***	-1.835***	-0.934***	-0.919***	-2.459***	-1.930***	-0.180	-0.379	-3.481***	-1.516**
	(0.0757)	(0.117)	(0.137)	(0.112)	(0.106)	(0.164)	(0.199)	(0.164)	(0.521)	(0.557)	(0.772)	(0.688)
Pseudo R2	0.1982	0.1236	0.0552	0.2007	0.2019	0.1292	0.0498	0.2040	0.2063	0.1410	0.0644	0.2050
Obs.	34,480	34,060	34,071	31,707	17,603	17,369	17,397	16,077	16,548	16,345	16,378	16,077

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Determinants of financial inclusion in Sub-Saharan Africa (marginal effects)

	All				Woman							
VARIABLES	(1) ACCOUNT_FI	(2) SAVINGS	(3) CREDIT	(4) E-PAIE	(5) ACCOUNT_FI	(6) SAVINGS	(7) CREDIT	(8) E-PAIE	(9) ACCOUNT_FI	(10) SAVINGS	(11) CREDIT	(12) E-PAIE
WOMAN	-0.0316***	0.00110	-0.00299	-0.0186***								
	(0.00551)	(0.00353)	(0.00272)	(0.00250)								
AGE	0.0112***	0.00110*	0.00458***	0.000312	0.00881***	5.61e-05	0.00485***	-0.000205	-0.00845	-0.0116***	0.00643	-0.000177
	(0.000811)	(0.000605)	(0.000497)	(0.000446)	(0.00106)	(0.000730)	(0.000681)	(0.000496)	(0.00735)	(0.00411)	(0.00411)	(0.00281)
AGE2	-8.92e-05***	-1.79e-05***	-5.23e-05***	-1.22e-05**	-7.06e-05***	-4.45e-06	-6.19e-05***	-1.38e-06	0.000242***	0.000154***	-5.91e-05	-1.94e-05
	(9.29e-06)	(6.85e-06)	(5.80e-06)	(5.51e-06)	(1.21e-05)	(8.27e-06)	(8.35e-06)	(6.03e-06)	(8.45e-05)	(4.91e-05)	(5.05e-05)	(3.44e-05)
EDUC	0.201***	0.0189***	0.0100***	0.0388***	0.192***	0.0192***	0.00147	0.0336***	0.211***	0.118***	0.0445**	0.0345**
	(0.00509)	(0.00493)	(0.00367)	(0.00222)	(0.00700)	(0.00668)	(0.00511)	(0.00275)	(0.0472)	(0.0240)	(0.0190)	(0.0151)
REV	0.0453***	0.0165***	0.00571***	0.00838***	0.0402***	0.0161***	0.00521***	0.00764***	-0.0245	0.00132	0.00133	0.00187
	(0.00199)	(0.00161)	(0.00121)	(0.000939)	(0.00262)	(0.00202)	(0.00155)	(0.00110)	(0.0178)	(0.0102)	(0.00854)	(0.00627)
EMPL	0.106***	0.0357***	0.0279***	0.0105***	0.102***	0.0323***	0.0229***	0.0146***	0.0341	0.0470*	0.0295	0.0209
	(0.00621)	(0.00460)	(0.00355)	(0.00293)	(0.00771)	(0.00555)	(0.00437)	(0.00322)	(0.0506)	(0.0280)	(0.0241)	(0.0180)
MOBILE	0.204***			0.0208***	0.173***			0.0121***	0.314***			0.0183
	(0.00658)			(0.00355)	(0.00828)			(0.00399)	(0.0617)			(0.0269)
MOB_ACCOUNT				0.101***				0.0768***				0.0675***
				(0.00275)				(0.00337)				(0.0180)
FSI	-0.00824***	0.000421**	0.000138	-0.00128***	-0.00814***	0.000167	0.000354*	-0.00107***	-0.0114***	-0.00682***	-0.00144	-0.00148**
	(0.000197)	(0.000180)	(0.000136)	(8.37e-05)	(0.000259)	(0.000249)	(0.000195)	(9.97e-05)	(0.00198)	(0.00198)	(0.00161)	(0.000672)
AGE*FSI									0.000208**	0.000173***	2.40e-06	-5.96e-07
									(8.45e-05)	(5.11e-05)	(4.87e-05)	(3.25e-05)
AGE2*FSI									-3.71e-06***	-2.14e-06***	-1.90e-07	2.21e-07
									(9.79e-07)	(6.13e-07)	(6.01e-07)	(3.95e-07)
EDUC*FSI									-0.000246	-0.000470	-0.000164	-1.38e-05
									(0.000536)	(0.000293)	(0.000232)	(0.000176)
REV*FSI									0.000725***	0.000333**	0.000122	7.07e-05
									(0.000204)	(0.000137)	(0.000111)	(7.35e-05)
EMPL*FSI									0.000782	0.000221	0.000132	-7.75e-05
									(0.000582)	(0.000348)	(0.000293)	(0.000211)
MOBILE*FSI									-0.00188***	0.000760***	0.000314**	-7.59e-05
									(0.000699)	(0.000178)	(0.000136)	(0.000308)
MOB_ACCOUNT *FSI									0.00153***	0.000881***	0.000639***	0.000105
									(9.88e-05)	(0.000148)	(0.000117)	(0.000206)
Obs.	34,480	34,060	34,071	31,707	17,603	17,369	17,397	16,077	16,548	16,345	16,378	16,077

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

The findings of Özşuca thus corroborated those of Aterido et al. (2013) in sub-Saharan Africa and Botric and Broz (2017) in Central and South Eastern Europe. In addition, we find that age has a non-linear effect on financial inclusion in SSA (coefficients of age is positive and that of age squared is negative). In reality, there is an inverted-U relationship, except for access to credit and online payment for women, regardless of the country's level of fragility. For women's access to these last two financial products, age has a positive effect up to a certain threshold where it becomes insignificant.

5. CONCLUSION

The importance of financial inclusion for sustainable economic growth and as a key factor in increasing prosperity by reducing poverty is well established. This paper has analyzed, from a microeconomic perspective, two dimensions determining women's financial inclusion in fragile states: access and use in the case of sub-Saharan Africa. Using a probit estimation technique, we first showed that the probability of being financially included is lower among women and in the most fragile states. Second, the results highlighted the differentiated incidence of women's individual characteristics on their financial inclusion in the most fragile countries. Indeed, on the one hand, youth, poverty and lack of mobile phones are the discriminating factors in financial services such as accounts and savings. On the other hand, women's individual characteristics do not explain the likelihood of making online payments in fragile states.

The results of this study suggest the need for efforts to improve gender parity in the formal financial system. By demonstrating the individual attributes considered important in explaining women's low financial inclusion, the findings of this study could provide useful information for policy development to improve women's low inclusion. Such policies could thus promote women's economic empowerment or at least reduce their financial access deficit in the most fragile states in Sub-Saharan Africa. As noted by the World Bank (2011), women are disadvantaged in many areas, including labor force participation and education, which affects their participation in the modern market economy, including the formal financial sector. Policies to increase women's access to financial services must take these other dimensions into account if women are to benefit from financial services as much as men. For example, mobile phone ownership rates generally exceed financial inclusion rates in fragile and conflict-affected states, indicating the potential for expanding access to mobile finance. Further research is needed to better understand the channels that reduce women's access to financial services and to identify new products, processes and technologies that can increase women's financial inclusion.

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Fragilité des Etats et déterminants de l'inclusion financière des femmes en Afrique subsaharienne

Résumé - L'objectif de cet article est d'analyser le rôle de la fragilité des Etats africains sur les déterminants individuels de l'inclusion financière des femmes. Pour cela, nous utilisons des données microéconomiques sur 35 pays d'Afrique subsaharienne en 2017. À l'aide d'une spécification probit et d'un modèle de sélection de Heckman, nous montrons que la probabilité d'une inclusion financière est plus faible chez les femmes et dans les États fragiles. Les résultats mettent aussi en évidence l'incidence différenciée des caractéristiques individuelles des femmes sur leur inclusion financière dans les Etats les plus fragiles. La jeunesse, la pauvreté et le manque de téléphone portable sont des facteurs discriminants chez les femmes pour ouvrir un compte et se constituer une épargne. En revanche, les caractéristiques individuelles des femmes n'expliquent pas la probabilité d'effectuer des paiements en ligne dans les Etats fragiles. Par conséquent, les politiques visant à promouvoir l'inclusion devrait varier en fonction du type de service financier et du niveau de fragilité des Etats.

Mots-clés
Inclusion financière
Etats fragiles
Genre
Afrique subsaharienne