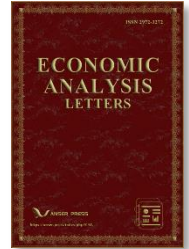# Access to and use of financial services in ECOWAS countries: Is mobile money closing the gender gap?

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ABSTRACT

This paper deals with the gender gap in accessing and using financial services provided by mobile money and financial institutions. Using data from ECOWAS member countries, we applied the Fairlie decomposition method to estimate and decompose the gender gap. The results show that mobile money contributes to improving of the use of services compared to financial institutions. However, it also increases the gender gap in women's disadvantages in accessing and using these services. The difference in the level of education and income between males and females is the main factor explaining the gender gap.

KEYWORDS

Gender gap; mobile money; financial inclusion; Fairlie decomposition; ECOWAS

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1. Introduction

The issue of financial inclusion (FI) has gained special importance in recent years. The concept is defined by the World Bank as "the uptake and usage of a range of appropriate financial products and services by individuals and MSMEs (micro, small, and medium enterprises), provided in a manner that is accessible and safe to the consumer and sustainable to the provider" (Pazarbasioglu et al., 2020). The issue is all the more important as access to financial services remains low in many developing countries. According to Demirgüç-Kunt et al. (2020), the rate of account ownership by adults is estimated at 69% worldwide. But there are huge disparities between countries. In developing countries, the rate is less than 63%, compared with 94% in high-income countries. In addition to the disparity between countries, some studies show that there is a gender gap in terms of access to and use of financial services. For Demirgüç-Kunt et al. (2020), the gender gap in account ownership is estimated to have risen by 9% between 2011 and 2017 in developing countries.

The reason for the great interest in financial inclusion is that it is a driver of several development outcomes, including growth and welfare (Chibba, 2009; Dimova & Adebowale, 2018; Lopez & Winkler, 2018; Hendriks, 2019). Chibba (2009) argued that FI is a complementary solution to fight against poverty and, therefore, to achieve the Millennium Development Goals (MDGs). Some empirical results also point in the same direction. Indeed, Dimova & Adebowale (2018) used data from Nigeria and several estimation approaches to show that access to formal financial services improves household welfare.

With the development of the Internet and mobile phones, there is a new concept called digital financial inclusion, which is related to the use of digital financial services such as mobile phones and the internet to improve financial inclusion. (Pazarbasioglu et al., 2020).

Over the past decade, mobile money has gradually developed in developing countries. As predicted by Dono van (2012), its large adoption made it become a general platform, transforming many sectors of the economy, including commerce, health, agriculture, etc. A body of studies argued that mobile money adoption generates benefits for households. Indeed, households using mobile money are more financially resilient. Suri et al. (2012) used difference-in-ifference regression to show that in Kenya, when a health shock occurs, households using mobile money can increase their health expenditure while keeping other consumption expenditure unchanged. In contrast, other households are forced to drastically reduce their consumption expenditures to cope with the health shock. Ky et al. (2018) found evidence from Burkina Faso suggesting that using mobile money increases the propensity of saving for health emergencies. For Suri & Jack (2016), in the long-run, mobile money contributed to lifting people out of poverty in 2% of Kenyan households.

Another benefit expected from the development of mobile money is that it will contribute significantly to financial inclusion (Lashitew et al., 2019). Then, mobile money is expected to not only increase access to and use of financial services but also reduce the financial inclusion gap between men and women. For Della Peruta (2018), the contribution of mobile money to financial inclusion should be nuanced, as it depends heavily on the banking system.

Even if mobile money contributes to financial inclusion, an important question remains: Does mobile money play a role in reducing the gender gap in access to and use of financial services? Studies addressing the issue are rare in the literature. The existing literature is focused on the gender gap in credit access (Aterido et al., 2013; Mazumder et al., 2017; Traore, 2023) and the use of financial services provided by banks or microfinance institutions (Hansen & Rand, 2014; Corsi & De Angelis, 2017). Mobile money is intended to attenuate the gender gap in access to and use of financial services by providing financial services that classical financial institutions are not able to provide.

Questioning the existence of a gender gap in access to and use of the financial services offered by mobile money and the factors that determine it is therefore an important issue. This topic is rare in the literature, especially in developing countries. This paper aims to contribute to a better understanding of the phenomenon by identifying

and decomposing a potential gender gap. For this purpose, we applied the Fairlie decomposition method to data from the Economic Community of West African Countries (ECOWAS) member countries.

The rest of the paper is organized as follows: The first section presents the method and data used. The second section is devoted to the results and discussion, and the last section concludes.

2. Method and data

2.1. Method

The methodological approach consists of two stages. First, we tested the existence of a gender gap in access to and use of financial services provided by mobile money and traditional financial institutions. Specifically, the aim is to check whether the proportion of men who have access to or have used a given financial service is significantly different from that of women.

After testing the significance of the gap, we used the Fairlie (2005) decomposition method to identify the explained and unexplained components of the gap. The Fairlie method is an extension of the Oaxaca (1973) decomposition method. While the Oaxaca-Blinder decomposition method is originally used for linear models in which the interest variable is continuous, the Fairlie approach allows the decomposition of the gap when the variable of interest is binary. This method quantifies the difference in the probability of a particular outcome between two groups (namely men and women). It also quantifies the contribution of differences in observable characteristics to the gap. The Fairlie (2005) decomposition method can be formalized as follow:

Consider Y_i the probability of accessing or using a particular financial service (having an account, sending remittances, receiving remittances or paying bills) for individual i. This probability is explained by individual observable characteristics as follows:

$$Y_i = F(X_i\beta) \tag{1}$$

Where X_i is a set of individuals characteristics explaining the probability of accessing or using the services and, $F(.)$ is the function of cumulative probability. β is a vector of parameters to be estimated. Following Fairlie (2005) and using equation (1), the gender gap in the probabilities of accessing or using a particular financial service can be decomposed into two components as follows:

$$\bar{Y}^M - \bar{Y}^F = \left[\frac{\sum_{i=1}^{N_M} F(X_i^M \hat{\beta}^M)}{N_M} - \frac{\sum_{i=1}^{N_F} F(X_i^F \hat{\beta}^M)}{N_F}\right] + \left[\frac{\sum_{i=1}^{N_F} F(X_i^F \hat{\beta}^M)}{N_F} - \frac{\sum_{i=1}^{N_F} F(X_i^F \hat{\beta}^F)}{N_F}\right] \tag{2}$$

where $\bar{Y}^M$ and $\bar{Y}^F$ are the average probabilities of accessing or using a particular financial service for men and women, respectively. $\hat{\beta}^M$ and $\hat{\beta}^F$ are the estimated coefficients for men and women, respectively. The sample is also divided into two groups (men and women), with sizes respectively equal to N_M and N_F. X^J is a vector of observable characteristics of individual i in group J ($J=M,F$).

The first component of the difference in average probabilities in equation (2) is part of the gender gap, explained by the differences in observable characteristics between men and women. The second component, also called the *unexplained gap*, is the part of the gap due to the group processes of determining Y (Fairlie, 2005). It is the part of the gap that is attributable to the difference in the estimated coefficients ($\hat{\beta}^M$ and $\hat{\beta}^F$) or the difference in unobservable or unmeasurable characteristics. Even if debates exist in the literature, some studies argued that this gap is due to gender discrimination. As $\hat{\beta}$ is estimated with bias, it is misleading to interpret the second part of the gap as the effect of gender discrimination (Kunze, 2008).

Fairlie decomposition method allows us to estimate the contribution of each independent variable to the gap. This contribution for variable X_1 is estimated as in equation (3).

$$\frac{1}{N_F} \sum_{i=1}^{N_F} F(\hat{\beta_0} + X_{1i}^M \hat{\beta_1} + X_{ki}^M \hat{\beta_k}) - F(\hat{\beta_0} + X_{1i}^F \hat{\beta_1} + X_{ki}^M \hat{\beta_k}) \tag{3}$$

As stated in Traore (2023) the contribution of a variable can be positive or negative. A positive contribution means that reducing the difference between men and women in this variable reduces the gender gap. Conversely, a negative contribution of a variable means that reducing the difference between men and women in this variable increases the gap.

2.2. Data

We used Global Financial Inclusion Index (FINDEX) data from the World Bank Group. The third round was undertaken in 2017. This database provides more than 200 indicators on topics such as account ownership, payments, saving, credit, and financial resilience from more than 140 countries around the world. As we are interested in indicators relative to access to and use of financial services provided by mobile money on the one hand and by financial institutions on the other hand, we retain four indicators: Having an account, Sending money, Receiving money and, Paying bills. These indicators and the other variables of interest are described in Table 1.

Table 1. Variable description.

Variables	Description
Having an account*	1 if the individual has an account and 0 otherwise
Send money*	1 if the individual sent money in the 12 last months and 0 otherwise
Receive money*	1 if the individual received money in the 12 last months and 0 otherwise Paye
bills*	1 if the individual paid bills in the 12 last months and 0 otherwise
Employment	1 if the individual have a job and 0 otherwise
Age	Age in years
Education	Primary (1), secondary (2) and tertiary (3)
Income group	First quintile (1), second quintile (2), third quintile (3), fourth quintile (4), last quintile (5)
Country	Country of residence

*Notes: * This variable concerns services provided by both mobile money and financial institution.*

3. Results and discussion

3.1. Testing the significance of the gender gap

In this section, we first tested the difference in access to and use of financial services provided by mobile money versus those provided by financial institutions (Table 2). We found a surprising result, indicating that the proportion of individuals having a mobile money account is less than that of those having an account in financial institutions. This difference is more pronounced within the male group. This situation can be explained by the fact that before the year 2017, cell phone penetration in rural areas of ECOWAS countries was very moderate. The results also highlighted that the proportion of individuals using mobile money services (Sending/receiving money and paying bills) is higher than that using the same services provided by financial institutions. All these results show that, in terms of access (having an account), financial institutions are more solicited than mobile money. On the other hand, in terms of use for certain transactions, mobile money is much more in demand than financial institutions. This reinforces the idea that mobile money offers more possibilities to individuals than traditional financial institutions.

Table 2. Test of the difference in access to and use of mobile money versus traditional financial services.

	Male			Female		
	Mobile money	Financial inst.	Difference	Mobile money	Financial inst.	Difference
Have account	30.22	33.57	-3.35***	19.38	20.69	-1.31*
Send money	50.46	28.21	22.25***	37.91	22.55	15.36***
Receive money	48.99	25.29	23.70***	52.22	24.91	27.31***
Pay bills	16.53	11.36	5.17***	11.03	10.87	0.16

Secondly, we tested for the existence of a gender gap in access to and use of financial services provided by mobile money on the one hand and financial institutions on the other. Then, we tested the significance of the difference in the proportion of men versus women accessing and using these services, respectively. The results show that the proportion of men is significantly higher than that of women for all the services except for receiving mobile money (where there is an advantage of 3.35 percentage points for women), receiving money, and paying bills using financial institutions (where we found no significant difference between men and women). Indeed, the proportion of men having a mobile account is 10.84 percentage points higher than that of women. This proportion for financial institutions is 12.88 percentage points in favor of men. So, except for receiving money, we note a gender gap in the disadvantage of women in accessing and using the financial services offered by mobile money. In general, these results point out that there is a gap in the disadvantage of women in the access to and use of mobile money services.

Recalling the results contained in Tables 2 and 3, we can state that, although mobile money seems to have improved access to financial services compared with traditional financial institutions, it is important to note that it has not eliminated the gender gap in the use of these services.

Table 3. Test of gender gap difference in access to and use of mobile money versus traditional financialservices.

	Mobile money			Financial institutions		
	Male	Female	Difference	Male	Female	Difference
Have account	30.22	19.38	10.84***	33.57	20.69	12.88***
Send money	50.46	37.91	12.55***	28.21	22.55	5.66***
Receive money	48.99	52.22	-3.23*	25.29	24.91	0.38
Pay bills	16.53	11.03	5.50***	11.36	10.87	0.49

Notes: The data in the table represents the proportion (in %) of individuals who access or have used the related services.

3.2. The determinants of access to and use of financial services

Table 4 shows the results of regressing the variables of access to and use of financial services on a set of explanatory variables, including the gender variable. These results confirm those contained in Table 3. Indeed, being a woman reduces the probability of accessing and using the financial services offered by mobile money, except for receiving mobile money. For services offered by traditional financial institutions, the results show a gender gap to the disadvantage of women for "having an account" and "sending money". However, the coefficients associated with the gender variable are not statistically significant for receiving money and paying bills using financial institutions. This further corroborates the results in Table 3. It is also important to emphasize education level is a very important determinant of access to and use of financial services, especially those provided by mobile money. Indeed, a higher level of education increases the probability of accessing and using financial services.

In this section, we applied the Fairlie (Fairlie, 2005) decomposition method to decompose the gap into two components: the explained and the unexplained gaps. The explained part of the gap is the difference in access to and use of financial services due to the difference in observable characteristics between women and men. Table 5 shows the results of this decomposition. We computed the decomposition for the services for which the gender gap is significant.

Table 4. Probit model of access to and use of financial services.

	Mobile money				Financial institution			
	Have account	Send money	Receive money	Pay bills	Have account	Send money	Receive money	Pay bills
Gender (Male=1)	0.219***	0.201***	-0.106**	0.166***	0.199***	0.106**	-0.0419	0.00992
	(0.0268)	(0.0508)	(0.0497)	(0.0642)	(0.0273)	(0.0522)	(0.0519)	(0.0628)
Employment	0.248***	0.279***	-0.0792	0.188**	0.321***	0.158**	0.120*	0.103
	(0.0297)	(0.0581)	(0.0562)	(0.0740)	(0.0305)	(0.0614)	(0.0615)	(0.0750)
Age	0.0217***	0.0423***	-0.00836	0.0207*	0.0444***	0.00769	-0.00702	-0.00959
	(0.00406)	(0.00827)	(0.00771)	(0.0107)	(0.00404)	(0.00803)	(0.00789)	(0.00975)
Age squared	-0.0003***	-0.0004***	0.0001	-0.000223*	-0.000409***	-9.40e-05	7.73e-05	5.95e-05
	(4.86e-05)	(9.99e-05)	(9.19e-05)	(0.000131)	(4.73e-05)	(9.34e-05)	(9.11e-05)	(0.000115)
				Education level (Base=Primary)				
Secondary	0.431***	0.269***	0.191***	0.294***	0.748***	0.420***	0.448***	0.0759
	(0.0280)	(0.0524)	(0.0513)	(0.0660)	(0.0286)	(0.0573)	(0.0581)	(0.0683)
University	0.726***	0.563***	0.342***	0.523***	1.487***	0.507***	0.514***	0.200*
	(0.0663)	(0.102)	(0.0990)	(0.111)	(0.0721)	(0.0890)	(0.0901)	(0.106)
				Income Group (Base=First quintile 20%)				
Second quartile	0.168***	-0.108	0.0167	-0.173	0.109**	0.0274	-0.0802	-0.216*
	(0.0476)	(0.0973)	(0.0938)	(0.125)	(0.0494)	(0.110)	(0.112)	(0.129)
Third quintile	0.182***	0.121	0.0976	-0.00794	0.170***	-0.0541	0.0131	-0.213*
	(0.0465)	(0.0935)	(0.0910)	(0.118)	(0.0479)	(0.106)	(0.105)	(0.122)
Fourth quintile	0.191***	0.123	0.0533	-0.0626	0.301***	0.0462	0.0923	-0.151
	(0.0451)	(0.0904)	(0.0881)	(0.114)	(0.0460)	(0.0987)	(0.0983)	(0.113)
Last quintile	0.353***	0.395***	0.123	0.126	0.476***	0.230**	0.136	-0.0366
	(0.0432)	(0.0854)	(0.0834)	(0.106)	(0.0441)	(0.0930)	(0.0932)	(0.105)
Constant	-1.526***	-1.431***	-0.0382	-1.774***	-2.323***	-1.268***	-1.040***	-1.016***
	(0.0846)	(0.175)	(0.166)	(0.225)	(0.0874)	(0.179)	(0.177)	(0.211)
Observations	11,791	2,993	2,993	2,993	11,791	3,273	3,273	3,273

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1, Decomposition of the gender gap.

The most important observation we can make is that a significant part of the gender gap in access to and use of mobile money services remains unexplained by differences in the observable characteristics between men and women. For example, for the use of mobile money as a means of bill payment, for a gap of 5.5 percentage points, only 2.28 i.e. around 41% is explained by differences in observable characteristics. The remaining 59% of this gap is the unexplained part. Some authors attribute this unexplained part to discrimination against women. For access to financial services (having an account), the results of the decomposition for mobile money contrast with those of financial institutions. Indeed, the explained part of the gender gap is 42% (4.56 percentage points of 10.84 percentage points) for mobile money, while it is 57% (7.41 percentage points of 12.88 percentage points) for financial institutions.

Table 5. Aggregate decomposition of the gender gap.

	Mobile money			Financial institutions		
	Total gap	Explained	Unexplained	Total gap	explained	Unexplained
Have account	10.84	4.56	6.28	12.88	7.41	5.47
Send money	12.55	5.16	7.39	5.66	2.31	3.35
Receive money	-3.23	0.98	-4.21	-	-	-
Pay bills	5.50	2.28	3.22	-	-	-

Table 6 contains the results of the detailed decomposition of the explained part of the gender gap. The difference in the level of education between men and women contributes to explaining the access to and use of all financial services (mobile money or financial institutions). As for the difference in employment status, it influences the gap in terms of access (having an account) and use of financial services as a means of sending money. It is important to notice that the difference in income between men and women also influences the gender gap in access to and use of financial services. As all the significant coefficients are positive, this means that to reduce the gender gap, we need to reduce the differences between men and women in these observable characteristics. Differences in

education levels are the factor that most influences the gender gap in access to and use of financial services. In fact, the relative contribution of this factor is estimated at between 13 and 41%, depending on the financial service. This means that if men and women had the same level of education, the gender gap would be reduced by the relative contribution of the level of education.

Table 6. Detailed decomposition of the gender gap in access to and use of financial services.

	Mobile money			Financial institutions		
	Have account	Send money	Receive money	Pay bills	Have account	Send money
Employment	0.0065***	0.0084***	-0.0014	0.0024	0.0063***	0.0019***
	(0.0010)	(0.0028)	(0.0032)	(0.0017)	(0.0011)	(0.0007
	6.00%	6.69%	4.33%	4.36%	4.89%	3.36%
Age	-7.95e-05	0.0151***	-0.0026	0.0023**	-0.0009**	0.0007
	(0.0003)	(0.0022)	(0.0026)	(0.0011)	(0.0005)	(0.0016)
	-0.07%	12.03%	8.05%	4.18%	-0.7%	1.24%
Education	0.0286***	0.0168***	0.0102***	0.0119***	0.0531***	0.0137***
	(0.0022)	(0.0035)	(0.0035)	(0.0027)	(0.0024)	(0.0021)
	26.38%	13.39%	-31.58%	21.64%	41.23%	24.20%
Income group	0.0105***	0.0110***	0.0037	0.0062***	0.0158***	0.0072***
	(0.0016)	(0.0024)	(0.0025	(0.0021)	(0.0016)	(0.0019)
	9.69%	8.76%	-11.46%	11.27%	12.27%	12.72%
Observations	11,791	2,993	2,993	2,993	11,791	3,273

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; The contribution of each variable (in %) to the total gender gap is in bold after the standard errors.

4. Concluding remarks

This study contributes to the debate on the role of mobile money in improving financial inclusion, particularly by reducing the gender gap in access to and use of financial services. The results indicate that mobile money improves the rate of use of financial services compared with financial institutions. However, this improvement translates into an increase in the gender gap in access to and use of these services. These findings call for the implementation of policies to help reduce this gender gap so that mobile money can fully play itsrole in improving financial inclusion. More specifically, we need to act on the variables that contribute most to the gender gap, namely level of education and level of income. In this respect, programs to improve access to education for young girls and the development of income-generating activities for women could contribute effectively to reducing the gender gap in access to and use of financial services.

Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest.

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