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## Article

# Financial inclusion and gender income inequalities in informal entrepreneurship: The case of Cameroon

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## Financial inclusion and gender income inequalities in informal entrepreneurship: the case of Cameroon

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### Abstract

The purpose of this study is to analyze the effect of access to different financial products in reducing income inequalities between men and women working in the informal sector in Cameroon. To this end, we use the World Bank database World Bank Global Financial Inclusion (Global Findex) dataset 2018 to assess the evolution of access to financial services through a descriptive analysis and the fourth Cameroonian survey conducted by the National Institute of Statistics in 2014 to estimate a probit model and a Fairlie decomposition model. Empirical results suggest that indeed, income inequality between the sexes continues to increase in Cameroon, regardless of the indicator used to measure it. In particular, women working in the informal sector use services such as bank accounts and credit cards more than men, but women also use non-formal financial services the most. Among the inclusion factors of the actors involved, obtaining credit to start a business is a key element for an individual working in the informal sector, yet there are significant gaps in accessing credit between men and women in informal activities and gender inequalities explain 13.96% of this gap. This means that when it comes to accessing credit, men are more financially included than women. These results lead us to make recommendations on economic policies to improve access to credit and expand the use of mobile financial services among women working in the informal sector to reduce income inequality between the sexes in Cameroon.

**Key words:** financial inclusion, gender inequality, income inequality, informal economy.

**JEL Classification:** O16, J16, D33, D63, O17.

## 1. Introduction

Today, the informal economy represents an incompressible part of the economic activity in many countries, both developed and undeveloped. According to the International Labour Organization (ILO, 2015), the informal economy accounts for between 50 and 75% of jobs in developing countries. In Cameroon, according to the National Institute of Statistics, the informal sector accounted for more than 90.5% of jobs in 2010 and 88.6% in 2015 (NIS, 2010, 2015). However, the informal sector is often presented as a sector in which more women than men work (54% versus 46% in the case of Cameroon) (Chen, 2001).

In addition, it appears that male-led units outperform female-led units. In general, women earn less income from their work than men (Chen, et al., 2006; Chant, 2011; ILO, 2018). One of the reasons for women's poor performance is the trade-offs between their participation in the labour market and their domestic work (Chant, 2008; Amin, 2010; Yelwa et al., 2015). The other cause and not the least important is the difficulty in accessing funding, which is considered one of the most important factors in the economic environment that limit their growth (Cull et al., 2014).

The level of access to finance is very low in Africa and is particularly low for the informal economy; and more for women who own production units in the informal sector than for men (Andersen and Muriel, 2007). In Cameroon, more than 90% of jobs and businesses belong to the informal sector, yet only 5% of this population and less than 34% of these businesses have bank accounts or access to a savings and/or bank credit account (World Bank, 2013). Indeed, the 2014 Global Findex shows that 47% of women worldwide had an account at a banking institution, compared to 70% for men. This means that women use or appear to have less access to all types of financial services than men (Jackson, 1998; Demirguc-Kunt et al., (2013). This low use of financial services by women makes studies on the relationship between financial inclusion and the level of informality all the more useful.

Private sector financing strategies require policies to facilitate financial inclusion and capital market development to achieve sustainable development (Missoka, 2013; Floro, 2001). Financial inclusion is defined as the provision of low-cost financial services, accessible to all populations (individuals and businesses) in difficulty and excluded from traditional financial services (AFI, 2012; 2015), it is however limited by several obstacles. These barriers are grouped into three dimensions: access to credit, depth of credit and credit intermediation (Musa et al., 2015). Theoretically, the high costs of participation in the credit market led to a lack of access to credit due to high transaction costs, annual fees, and/or onerous documentation requirements required by formal financial institutions and not available to informal firms (Demirguc-Kunt and Klapper, 2012a; 2012b; Faye, 2013, La Porta et al., 2015).

In addition, the borrowing constraints that are imposed on businesses (high collateral, personal contribution) limit the access of informal workers who do not have such collateral (Barnejee et al., 2010; Boehe, 2013; Rajesh et al., 2014). Similarly, the cost of financial intermediation is considered high because of asymmetries between banks and borrowers. In fact, smaller borrowers with less capital are charged higher interest rates and fees because they represent more risk (Beck, et al., 2011). Yet the embryonic development of the financial market in Africa and Cameroon in recent years suggests that these strategies do not appear to have any effect on gender inequalities and particularly on the growing income inequality between formal and informal jobs (Chen, 2001; Yorulmaz, 2012; Thankom et al., 2015).

Empirically, addressing the growing inequality in Cameroon requires knowledge of the sources of gender inequality that are predominant in informal activities. Empirical evidence in fact shows that women automatically earn less than men in any sector (formal or informal), creating a wage gap between men and women (Jackson and Pearson, 2005). There are indeed more women (32.16%) in



## 2. Methodological approach

### 2.1. Data sources

To achieve the above objectives, we tapped two databases. The first is from the World Bank Global Financial Inclusion (Global Findex) dataset of July 2018, which covers 140 economies, including Cameroon. This database contains about 850 economic and socio-demographic indicators. It is used to assess the evolution of access to financial services in the country.

For the analysis itself, we will use survey data more specifically from household surveys. To this end, we will use the fourth Cameroonian survey of 46,100 individuals carried out by the National Institute of Statistics in 2014. This database, which contains more than 500 variables, has made it possible to update the poverty profile and other indicators on the living conditions of households in the country. In addition, we are using the first, second and third Cameroonian household survey to assess the evolution of inequality in the country.

From these databases are derived the analysis variables: gender, age, education level, income appreciated/by quintiles and employment sector (1 for informal sector and 0 otherwise), variables on access to financial services (financial inclusion) such as obtaining credit, holding securities, etc.

#### ***Age and experience***

According to human capital theory, the employee's professional experience on the labour market (age) or seniority in the company are factors that explain his or her compensation (Jean-Louis, 1992), hence its inclusion in our model.

#### ***Education***

In theory, the link between education and inequality in labour income is far from simple. The impact of a change in the composition of the educated workforce can be seen as the sum of two distinct effects (Knight and Sabot, 1983): (i) a composition effect, whereby an increase in the share of highly educated individuals increases earnings inequality up to a certain point, but then lowers it; and (ii) a rate-of-returns effect, whereby an increase in the share of highly educated workers alters the returns to education.

#### ***Job type***

The type of employment has an impact on the level of earnings. Self-employed, temporary and permanent workers generally have different pay levels for the same skills.

#### ***Gender***

Differences in labor market performance between men and women remain striking in most countries. Women are less likely than men to be employed, and those who are employed generally earn less than their male counterparts, with consequent effects on access to financial services.

### 2.2. Methodology

After the descriptive analysis, we move to the calculation of inequality indicators and then to the econometric analysis. The calculation of inequality indicators allows us to highlight the evolution of income inequalities in the country.

#### ***a) Measurement/Indicators of Inequality***

In the literature, there are several measures/indicators to assess inequality within a distribution. These measures can be divided into two main groups, namely traditional measures and contemporary measures (the Atkinson index and the Kolm-Pollack index). However, for this work only the traditional measures are used. Among these measures, we have the Gini coefficient and the Theil entropy index.

The Gini coefficient (1921) is calculated from the Lorenz curve (1905) that links the cumulative

proportions of the population in classes (percentiles, deciles) with the corresponding cumulative percentages of income. The Gini coefficient is formally equivalent to:

$$I_{gini}(X) = \frac{1}{2n^2 \mu(X)} \sum_{i=1}^n \sum_{j=1}^n |x_i - x_j|$$

With:  $\mu(X) = \frac{1}{n} \sum_{i=1}^n x_i$ , the mean in the sample

This GINI coefficient can be interpreted as follows: the closer the value of the GINI coefficient is to zero, the more egalitarian the distribution of income is considered to be in society. Conversely, the closer the value is to 100, the more unevenly income is distributed throughout society.

The generalized entropy measure proposed by Theil (1967) is derived from thermodynamic measures of entropy. It measures the disorder of a thermodynamic system by linking the concept of disorder to the concept of inequality, and by using income instead of probabilities. Theil obtains his measure of inequality as follows:

$$S = \frac{1}{n} \sum_{i=1}^n \frac{x_i}{\mu} \log \frac{x_i}{\mu}$$

$x_i$ : Income of individual  $i$

$\mu$ : Mean of the distribution

This indicator belongs to the generalized entropy class defined by:

$$S_c = \sum_{i=1}^n \frac{\left( (x_i/\mu)^c - 1 \right)}{nc(c-1)}$$

Pour tout  $c \neq 0,1$

If  $c=2$ , the generalized entropy is defined as half the coefficient of variation squared:

$$S_2 = \frac{\sigma^2}{2\mu^2}$$

The generalized entropy (GE) measure varies from 0 to  $\infty$  when we have an equal income distribution, which means that all incomes are the same.

Subsequently, we broke down the results obtained from the Gini index and the Theil index to further refine the information. The non-decomposition approach allows us to compare different indices, if they are normalized. This comparison allows a classification of the different sub-populations by specifying the inequalities that prevail within them.

### **b) Econometric approach**

To achieve the desired results in this study, we estimated a structural model:  $fin_i = (Age_i, Gender_i, Income_i, edu_i)$ .

This model was used by Musa et al. (2015) to assess the determinants of access to financial services in Nigeria. However, for a better analysis, we introduced the employment sector since it has an influence on access to financial services. IN fact, individuals who work in the formal sector have a stable income and therefore are more likely to have credit because they have a bank account. By introducing this variable, the model becomes  $fin_i = (Age_i, Gender_i, Income_i, edu_i, employ_i)$ .

In concrete terms, we estimated the following ordered probit model using the Maximum Likelihood method as did Musa et al. (2015).

$$\log \left[ \frac{pr(fin_i)}{1 - pr(fin_i)} \right] = \alpha_1 + \alpha_2 age_i + \alpha_2 (age^2)_i + \alpha_3 gender_i + \alpha_4 icode_i + \alpha_5 edu_i + \alpha_6 Employ_i + \varepsilon_i$$

$pr(fin_i)$ : Probability that the individual has access to financial services.

To highlight the financial inclusion gap that exists in Cameroon between men and women, we opted for the improved Oaxaca-Blinder decomposition method proposed by Fairlie (1999 and 2006) and replicated and used by Musa et al. (2015).

However, before proceeding with the econometric estimates, we conducted the factor analysis on the variables related to access to financial services versus the informal sector. This will first provide insight into the most important variable in the analysis.

### 3. Estimation results

#### 3.1. Statistical analysis of income inequality and financial inclusion factors

##### a) *Inequality indicators/measures: Evolution of inequalities in Cameroon between 2001-2014*

The following tables show the evolution of inequalities between 2001-2014 using the GINI and ENTROPY indexes. The results show that income inequality continued to grow in Cameroon over the period in question, regardless of the indicator used to measure it. The GINI index rose from 0.40 in 2001 to 0.44 in 2014 with a slight drop in inequality in 2007, while the Entropy index rose from 0.33 in 2001 to 0.34 in 2014, with a slight drop of 0.28 in 2007.

**Table 2: Income inequalities**

Inequality index	2001		2007		2014	
	Value	Standard deviation	Value	Standard deviation	Value	Standard deviation
<b>GINI</b>	0.404143	0.002621	0.390662	0.002001	0.441014	0.002256
<b>ENTROPY</b>	0.337534	0.007789	0.280288	0.004413	0.349534	0.005326

**Source:** Author, from ECAM I, II, III and IV

By breaking down these indexes into two sub-populations, the results of the decomposition overall show that the two gender inequality indexes are not very different from inequalities at the national level, and gender inequality is slightly more pronounced when using the Gini index versus the Theil entropy index. In this case, the Gini index best captures gender inequality in Cameroon.

**Table 3: Income inequalities based on gender (GINI index)**

Gender	2001		2007		2014	
	Value	Standard deviation	Value	Standard deviation	Value	Standard deviation
<b>Male</b>	0.417234	0,006693	0.424218	0,003795	0.471728	0.004183
<b>Female</b>	0.424707	0,011220	0.403045	0,003209	0.447604	0.003705

**Source:** Author, from ECAM I, II, III and IV

One of the objectives of the Cameroonian government is to reduce the Gini index or overall income inequality, which stood at 0.44 in 2014 (INS, 2014) and thus gender inequality constitutes more than 44% of this inequality.

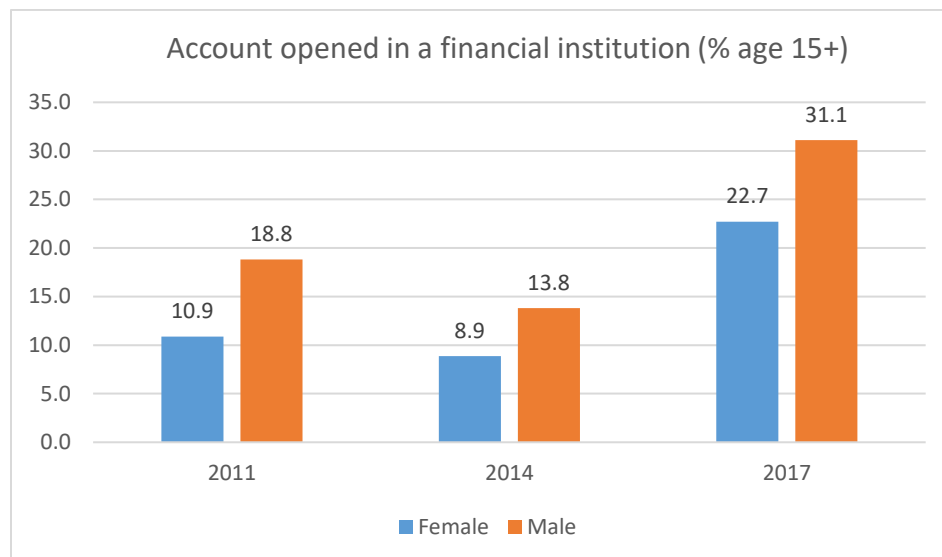
##### b) *Gender disparities in access to financial products*

In this section, we highlight the disparities in access to financial products in Cameroon. The variables selected for this exercise are having a bank account, having an account in an institution other than a bank, use of a bank card to carry out transactions, use of a cell phone to access one's online bank account, and having a mobile money account.



With regard to having an account in a banking institution, the graph below shows that the financial inclusion gap between men and women persists, even though significant progress was recorded between 2011 and 2017. We can see that over the period, many women over the age of 15 opened a bank account.

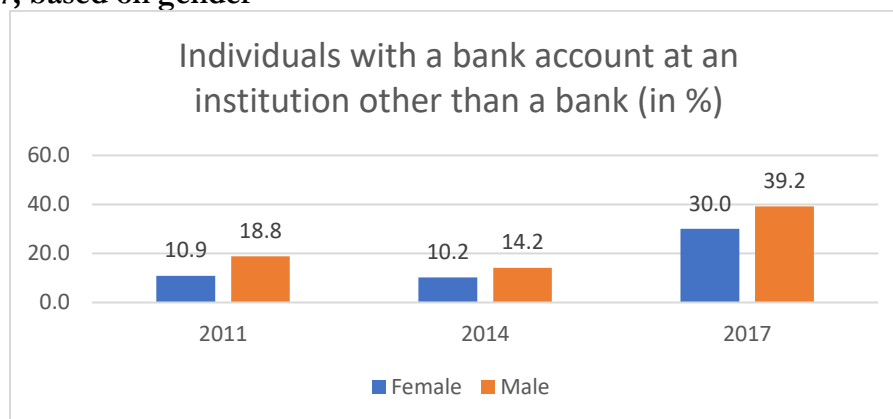
**Graph 1: Number of individuals with a bank account between 2011 and 2017, by gender**



**Source:** *Author, from the WBGF<sup>1</sup> (2018) dataset*

The trend is the same when considering ownership of an account at an institution other than a bank. Men still rank first.

**Graph 2: Number of individuals with an account at an institution other than a bank between 2011 and 2017, based on gender**

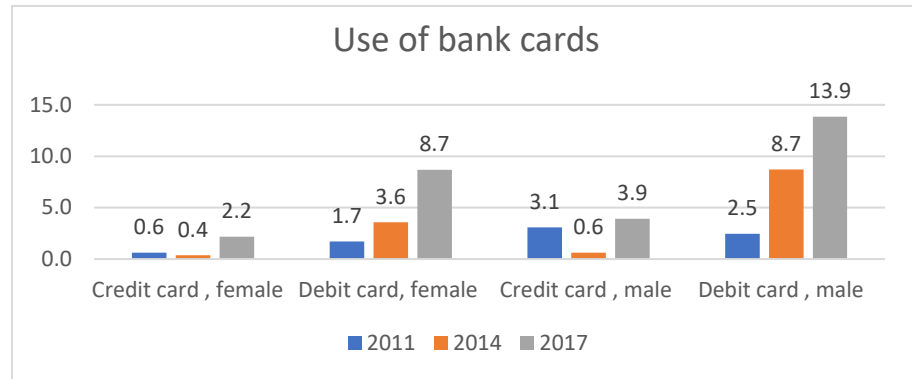


**Source:** *Author, from the WBGF (2018) dataset*

Regarding the use of bank cards, we can see that the situation improved significantly in 2017 compared to 2011, the gap is gradually narrowing between men and women in the use of prepaid cards. Between 2014 and 2017, the number of women using a prepaid card increased threefold.

<sup>1</sup> World Bank Global Financial Inclusion (Global Findex) dataset

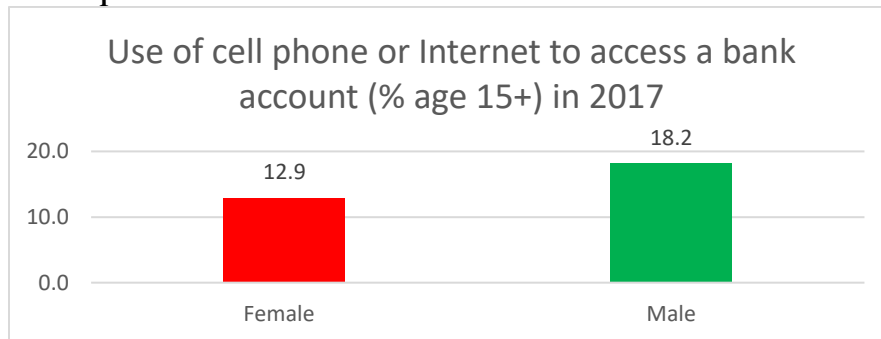
**Graph: Use of prepaid cards between 2011 and 2017**



**Source:** Author, from the WBGF (2018) dataset

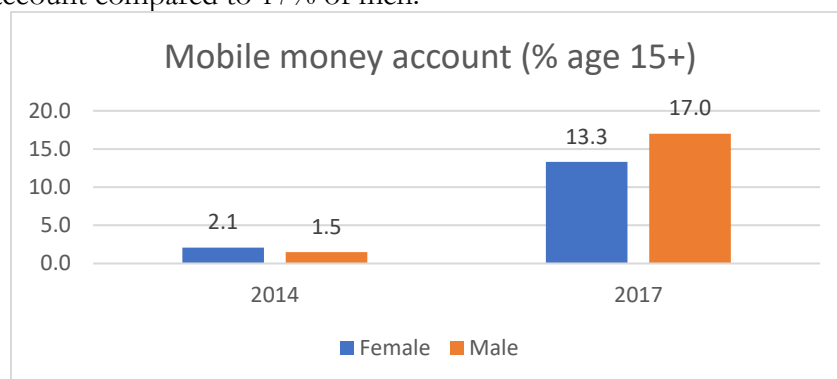
The graph below shows that men use their cell phones more than women to access their bank accounts and perform banking transactions; however, the gap is not that wide.

**Graph 4: Use of cell phone or Internet to access a bank account**



**Source:** Author, from the WBGF (2018) dataset

Regarding the use of the mobile money account, we realized that in 2014, women used this service more than men. In 2014, two out of every 100 women had such an account compared to 1.5 out of every 100 men, while the trend reversed in 2017. In fact, in 2017, 13.3% of women used a mobile money account compared to 17% of men.



**Source:** Author, from the WBGF (2018) dataset

### 3.2. Econometric analysis of the impact of financial inclusion on income inequality

#### a) Factor analysis

**Table 4:** Component matrix in relation to the first axis

Variables	Values
Obtained credit for business in the last 12 months, for business	0.557
Ownership of shares, securities or bonds	0.536
Number of loans	-0.683

**Source:** *Author, drawn from ECAM IV*

The factor analysis of the access to financial services variables shows that obtaining business credit is a major element for an individual working in the informal sector in terms of its weight or score when considering the first axis. This variable is directly followed by ownership of stocks, bonds or shares when looking at the component matrix.

#### **b) Average statistics of study variables**

After sorting the observations of the model's different variables, we obtain the table below that summarizes the central trend characteristics of some variables.

**Table 5: Descriptive statistics of the variables**

Variables	Observation	Average	Standard deviation	Min	Max
Obtained business credit	14881	1.892144	0.3102084	1	2
Gender	14881	1.446207	0.4971145	1	2
Age	14881	38.12634	14.74526	5	98
Level of instruction	14880	2.574731	1.188948	1	5
Income from main activity	14881	48943.72	116450.3	0,833	1.00e+07
Informality	14881	1.850615	0.3564797	1	2

**Source:** *Author, drawn from ECAM IV*

The ECAM IV survey data used for this analysis show that respondents range in age from 5 to 98 years, with an average of about 38 years per worker. The level of education varies between 1 and 5 years.

#### **b) Results of determinants of access to financial services on income**

With respect to the determinants of access to financial services as measured by obtaining credit and owning stocks/securities/bonds, the above model estimation yields the following results.

**Table 6: Regression of the ordered probit model of the global model**

Variables	Obtained business credit	Owens stocks/securities/bonds
Gender	-0.0288 (0.0297)	-0.1303 (0.0375)
Age	-0.0181*** (0.004)	-0.0087 (0.0114)
Age <sup>2</sup>	0.0001*** (0.0005)	0.0001*** (0.0001)
Level of instruction	-0,0924*** (0.0137)	-0,804*** (0.0293)
Informality	-0.0919** (0.0453)	0,1159 (0.0870)
Income	0.0356** (0.0160)	-0,1303 (0.0375)
Number of observations	14880	14880

Wald chi2(6)	60.73	81.57
Prob > chi2	0.0000	0.0000
Pseudo R2	0.0060	0.0354

**Source:** Author, drawn from ECAM IV, Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The table above contains two models of the determinants of financial inclusion. The first factor is obtaining credit from a formal institution. The model shows that age, experience (age squared), education, informality, and income level significantly determine whether a business secures credit at the 1 and 5%, respectively. However, while experience and income are positive determinants, female gender, age, education, and informality negatively affect the probability of workers obtaining formal credit from a formal banking institution to start a business.

Model 2 reflects ownership of stocks, securities or bonds. The model shows that only age and experience significantly determine at 1% the ownership of stocks, securities or bonds. While age positively explains the probability of owning stocks, securities or bonds, experience explains it negatively.

*c) Results of the effect of women's access to financial services in the informal sector*

**Table 7: Regression of the ordered probit model with restriction on employment sector and gender**

Variables	Obtained business credit	Owens stocks/securities/bonds
Age	-0,0216*** (0,0075)	-0,0191 (0,01792)
Age^2	0,00022*** (0,0000847)	0,0002 (0,00024)
Level of instruction	-0,1155*** (0,0230)	-0,1345*** (0,0547)
Income	0,03629 (0,0256)	-0,0642692 (0,06385)
Number of observations	5927	5927
Wald chi2(4)	33.12	15.28
Prob > chi2	0.0000	0.0042
Pseudo R2	0.0078	0.0221

**Source:** Author, drawn from ECAM IV, Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

If we consider women working in the informal sector, we obtain the following results. Age, experience, and education significantly determine securing credit, while only education significantly determines the ownership of stocks or bonds. However, among these factors only experience acts positively. This means that in model 1, if age increases by one year, it reduces the probability of a woman working in the informal sector obtaining credit from a formal institution by about 2%, while the increase in the educational level of the population reduces this same probability by 11%. Moreover, being a woman and having an activity in the informal sector reduces the possibility of owning shares, securities or bonds by about 14%. Overall, these results show that women are less financially included than men in the informal sector.

d) *Analysis of the determinants of the gender income gap by sector of employment using the Oaxaca-Blinder decomposition*

**Table 8: Fairlie non-linear decomposition of gender gap**

Variables	Decomposition	
	Obtained business credit	Owens stocks/securities/bonds
Age	0.0044*** (0.001599)	0.00021 (0.0003856)
Age <sup>2</sup>	-0.00356*** (0.00142)	(-0.000118) (0.0003296)
Level of instruction	(-0.00667) *** (0.00091)	(-0.001213)*** (0.0003855)
Income	0.00575** (0.0023)	(-0.0031)*** (0.00085)
Group (Men)	1.895706	1.987966
Group (Women)	1.888814	1.991395
Difference/gap	0.0059261	(-0.0034292)
Unexplained/gap	0.0050985 86.035%	(-0.0042022)
Explained/gap	0.0008276 13.965%	0.000773
Observations	12658	12658

**Source:** Author, drawn from ECAM IV, **Robust standard errors in parentheses** \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

For the Oaxaca-Blinder decomposition, the same sub-population is used as before. The purpose of this measure is to observe whether the difference in access to inclusive financial services between men and women can be linked to different factors. The results of this gender income gap decomposition indicate that female informal workers have a 1.88 probability of obtaining credit to start a business while men have a 1.89 probability. Similarly, the probability of owning stocks, securities, or bonds is 1.98 for men and 1.98 for women. The income gap is explained by about 14% by gender in terms of access to credit. Economically, this implies that the difference in access to credit between formal and informal jobs shows that men are more financially included than women.

#### 4. Conclusion and policy recommendations

The objective of this study was to analyze the effect of access to inclusive financial services in reducing income inequality between male and female owners of informal production units in Cameroon. To achieve this, we used two databases, namely the World Bank Global Financial Inclusion (Global Findex) dataset 2018, which is used to assess the evolution of access to financial services in the country; the second is the fourth Cameroonian survey conducted by the National Institute of Statistics in 2014 for the econometric analysis. Our methodology was based on the descriptive analysis of the evolution of access to financial services, we then proceeded to calculate the inequality indicators and subsequently estimated a probit model and a Fairlie decomposition model. Three major findings emerged from these results.

First, more women than men opened an account at a bank or non-bank institution between 2011 and 2017. This means that women easily prefer informal financing (such as market associations, tontines, family loans or donations) over formal financing, especially when they are engaged in informal activities. With regard to the use of bank cards, three times as many women as men use prepaid

services. That said, 13.3% of women used a mobile money account compared to 17% of men in 2017, meaning that women use mobile financial services less than men.

Second, income inequality continues to increase in Cameroon overall, regardless of the indicator used to measure it. Both indices in particular show that gender income inequality is not very broad, but it appears to be more pronounced when using the Gini index compared to Theil's entropy index.

Third, obtaining credit to start a business is a major factor for an individual working in the informal sector followed directly by ownership of shares, stocks, or bonds. In this sense, age (-0.0216), experience, and education (-0.00667) significantly but negatively determine getting credit when one is a woman, while education (-0.1345) alone is a significant determinant in whether an individual owns stock or bonds. This means that, in general, women are less financially included than men in the informal sector. Lastly, the gap between men and women in accessing credit is 0.01 and gender inequality explains 13.96% of this gap. This means that when it comes to accessing credit, men are more financially included than women.

Economic policy recommendations aim to improve access to credit and the use of mobile financial services for women working in the informal sector to reduce inequalities in accessing formal financial services and improve their business activities. For example, linking mobile financial accounts to a bank account, and increasing the number and rate of potential transactions would enable easy identification. This measure could become mandatory, for example, for all economic agents who hold a mobile money account or an informal activity, while allowing them to be registered with the administration.

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