Analysis of the Determinants of Financial Inclusion in Central and West Africa*†

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ABSTRACT

Using data from the Global Financial Inclusion database (Global Findex) of the World Bank, this study attempts to identify and analyze the determinants of financial inclusion in Central and West Africa, two of the least financial inclusive regions of the Africa continent. The findings indicate that access to formal finance in the two regions is mainly driven by individual characteristics such as gender, education, age, income, residence area, employment status, marital status, household size and degree of trust in financial institutions. However, Central Africa and West Africa differ with the entire Africa region on a number of important determinants of access to finance. Specifically, educated, working-age, urban resident and full-time employed are significant individual characteristics of access to formal account in both regions and in Africa. However, being male and/or married are positive determinants of financial inclusion for Central Africa and Africa, whereas income is significant in West Africa and Africa. In addition, household size has a negative impact on account ownership in West African and not in Central Africa. When we use the other financial inclusion indicators (saving, borrowing or frequency of use), the above determinants remain all significant for Africa, but not necessarily for Central Africa or West Africa, where they have different degree of significance. As policy recommendations, governments and their partners in these regions should adopt or strengthen regulatory laws to better protect financial services consumers, enlarge population access to education, ease access to finance for the vulnerable groups (women, youth, poor, etc), and continue their effort to increase the number of permanent and stable jobs created with special focus on gender and marital status in Central Africa and income and household size in West Africa.

Keywords: Access to finance; Financial inclusion; Global Findex; Central Africa; West Africa.

JEL: G20, R1

I. INTRODUCTION

Finance, by allowing optimal allocation of resources in the economy, contributes to economic growth (e.g., Bekaert et al. (2005); Henry (2000); Klein and Olivei (2008); Levine (1997); Levine et al. (2000); Pagano (1993); among many others). Financial institutions play crucial financial intermediary role between funds providers and funds seekers by the financial services they provided; therefore, it is capital to put in place an enabling environment for the furniture of efficient financial services.

During the last decades, the African financial system has grown rapidly, e.g., Allen et al. (2013), Allen, Otchere and Senbet (2011), Beck and Cull (2013), Beck, Fuchs and Uy (2009). From state owned banks in the 1980s subjected to very restrictive regulation, financial liberalisation and globalisation lead to major changes in the financial systems of many countries throughout the continent. According to Beck and Cull (2013), many financial markets indicators have improved from 2000 to 2011. For instance, the median value of the liquid liabilities of the economy as a percentage of GDP grew from 20% to 31%, domestic credits over GDP from 11% to 18%, and total deposits as a percentage of GDP from 12% to 22%. These improvements coincide with a high economic growth rate on the continent during the same period, the highest economic growth rate in the World after Asia: Africa has recorded annual economic growth rate of more than 5% over that period.

Despite this steady economic growth, a large part of the population remains marginalised (excluded from the financial system) and do not have access to formal financial services, especially the poor, the young and women. Demirguc-Kunt and Klapper (2012a) in their descriptive analyses of the survey database « Global Financial Inclusion » (so called *Global Findex*) show that less than a quarter (23%) of adults over age 15 years living in Africa have a bank account at a formal financial institution, the percentage is 50% for the whole sample and 41% for the developing world. To tackle the lack of access to basic financial services, the concept of « financial inclusion » or « inclusive finance » has been introduced recently. It refers to creating an enabling environment and developing innovative financial solutions to facilitate access to financial services to a bigger part of the population, by lifting the barriers. Without an inclusive financial system, the poor will continue to use their own limited savings to finance their livings and businesses, and hence, increase inequality and impair economic growth. The lack of

data on access to finance was one main obstacle to conduct thorough and deep analyses on financial inclusion across countries or regions. Since 2011, the *Global Findex* database available at the World Bank, which surveyed populations in 148 economies around the world, is closing the gap. However, given the high rate of poor peoples in Sub Saharan Africa, it makes sense to pay more attention to this part of the World.

The objective of this study is to identify and analyse the determinants of access to financial services in the Economic Community of the West African States (ECOWAS) and the Economic Community of Central African States (ECCAS). Two main reasons justify our focus on these two regional economic communities (RECs). Firstly, these regions are the least inclusive regions in Sub-Saharan Africa (only 11% and 23% of adults have access to finance in Central and West Africa, respectively). Secondly, these two RECs contain two of the most advanced monetary and custom unions of the continent, namely CEMAC and UEMOA.[1] More specifically, the study aims to: (i) identify and analyse the determinants of access to formal financial services in Central and West Africa; (ii) conduct comparative analyses between the two regions, and between them and Africa; and finally (iii) formulate policy recommendations for policy makers of the two regions for more financial inclusion.

The (theoretical and empirical) literature is rich on evidences that financial inclusion contributes to the improvement of the living conditions of the poor and other marginalised or vulnerable groups of the society by enabling them to access to finance. In particular, there are more evidences on the proven significant benefits of financial inclusion for households and businesses (see for instance: Aportela (1999); Ashraf et al. (2010); Banerjee et al. (2010); Collard et al. (2003); Dabla-Norris et al. (2014); Dupas and Robinson (2009); Karlan and Zinman (2010); Kempson and Whyley (1999); Marshall (2004); among many others). Our paper complements the few recent studies conducted on financial inclusion using the World Bank *Global Findex* database, e.g., Allen, Carletti, et al. (2013); Allen, Demirguc-Kunt, et al. (2012); Anson et al. (2013); Demirguc-Kunt and Klapper (2012a, 2012b); Demirguc-Kunt et al. (2013); Klapper and Singer (2013). In the next section on the literature review, we provide more details on these previous studies.

[1] CEMAC is the French acronym of Central African Economic and Monetary Community (in French: Communauté Économique et Monétaire de l'Afrique Centrale). UEMOA is the French acronym of West African Economic and Monetary Union (in French: Union Économique et Monétaire Ouest Africaine).

We, however, focus on Central and West Africa regions in order to bring a value added to the existing findings and make more specific policy recommendations. As we argued above, these two regions are the least financially inclusive in Africa. They also contain the two most advanced monetary and custom unions of the continent. Hence, we will conduct a global analysis over the entire Central Africa and West Africa regions, and carry comparative analyses between the two regions, to have more practical policy recommendations for the decision makers of these regions. The database that we use covers ten (10) countries of the ECOWAS region and eight (8) countries of the ECCAS region.[2] We use the following four financial inclusion variables: (1) "owned an account at a formal financial institution"; and for those who have an account, (2) "have saved in a formal account over the past 12 months"; (3) "have borrowed from a formal financial institution over the past 12 months"; and finally, (4) "have used frequently the account for cash withdrawals or payments during a month".

We find that, like in the rest of the African continent, the main barriers to access formal financial services in Central and West Africa are: "not enough money", "lack of necessary documentation", "high costs of financial services", "distance to formal financial institutions" and "lack of confidence in financial institutions". The proportion of adult population (more than 15 years old) who owns a formal account is 23% in West Africa and 11% in Central Africa. These proportions are relatively low compared to other regions of the continent, namely South Africa (51%) and East Africa (28%). Moreover, our analysis shows that financial inclusion in the two regions is positively influenced by the following individual characteristics: secondary or higher education level, working age group, high income quintiles, urban resident, full-time employed, married, smaller household size and trust in the financial institutions. Nonetheless, their impacts are different from region to region and depending on the financial inclusion indicator used. In addition, our findings reveal significant differences on the characteristics of those who have access to financial services in the two regions and in Africa taken as aggregate. More specifically, using the account ownership at a formal financial institution as the indicator of access to finance,

[2] The sample for ECOWAS is composed of 10 countries: 6 (out of 8) UEMOA countries (Benin, Burkina Faso, Mali, Niger, Senegal, Togo) and 4 (out of 6) WAMZ countries (Ghana, Guinea, Nigeria, Sierra Leone). Note that we do not have data for 2 UEMOA countries (Côte d'Ivoire, Bissau Guinea) and 2 WAMZ countries (Gambia, Liberia).
The sample for ECCAS is composed of 8 countries (out of 10): 5 (out of 6) from CEMAC – Cameroon, Congo, Gabon, Central African Republic and Chad; and 3 outside CEMAC – Angola, Burundi and Democratic Republic of Congo. We do not have data for the following countries: Equatorial Guinea (CEMAC member) and Sao Tome & Principe.

we find that, unlike in Africa (see Klapper and Singer (2013)), gender is a very strong determinant of access to finance in ECCAS region, while gender and marital status are not significant determinants of account ownership in ECOWAS. In addition, household size is a significant determinant of access to finance in West Africa, but not in Central Africa. These results confirm that the leading forces driven low access to finance in these two regions are not always the same as in the entire Africa region, thus a need to focus on specific issues in each of these regions.

In addition, the differences in results using the three other indicators of access to finance related to the use of the account (saving, borrowing, frequency of use) prove a sharper contrast with results for Africa found in Klapper and Singer (2013). In fact, only few potential determinants are strongly significant for ECCAS and ECOWAS, while there are almost all significant in Africa. Specifically, when we focus on the "saving" indicator, only income and employment status become significant determinants in ECCAS, while in ECOWAS, only education level, age and the degree of trust in the financial institutions are significant. When we focus on the "borrowing" indicator, only education and marital status have strong significant impacts in ECCAS, whereas in ECOWAS, education, age, income and household size are the most significant determinants. Similar trends are observed with the frequency of use indicator. However, the result on these last three financial inclusion indicators data might be less robust since less than 25% of the sample provide a valid answer to questions related to these indicators.

Based on these findings, we formulate the following recommendations for decision makers in the two regions. First, more incentive programmes should be put in place to facilitate access to financial services for youths, women and other vulnerable groups. This can be done, for instance by: promoting the benefits of using formal financial services in schools and local communities and associations; encouraging these targeted population to open accounts at formal banks by depositing their bursary and other governmental family allocations in their bank accounts; alleviating conditions to open an account for this vulnerable group of population, for instance, by simplifying the documentation requirements and reducing the financial services fees. Nowadays, with the increasing number of mobile phones users among the population in these countries, financial services providers have a good opportunity to create accessible financial products and services which better respond to the specific needs of different groups. Second, governments and their development partners should encourage and facilitate access to education. Finally, countries

in the two regions should adopt more aggressive stable jobs creation policies; this will certainly increase the income level of households and then facilitate access to financial services. More specifically, ECOWAS countries should engage in reforms that could provide incentive to household of large size as well actions that could improve the population trust into the financial sector. This could be done by building awareness on financial products, bringing financial service providers closer to potential clients, and taking actions to increase the integrity of actors in the financial sector. Besides, for ECCAS countries, actions that could help women to access to finance should be the main focus. Policy makers should consider carrying more studies to find out what are the main constraints for women in this region and take appropriate actions.

The remainder of the paper is structured as follows. In section 2, we present the literature review on the more recent works on financial inclusion. In section 3, we present the methodology and describe the variables and the data. In sections 4 and 5, we present and analyse the empirical results. We first provide an overview and descriptive analyses of financial inclusion in the two regions, and next, conduct further econometric regression analyses. Finally, we conclude in the last section 6 and formulate policy recommendations.

II. LITERATURE REVIEW

This section reviews the most recent works on financial inclusion relevant for our research questions and done mainly using the survey data of the *Global Findex* database.

Demirguc-Kunt and Klapper (2012a) provide the first descriptive analysis of the *Global Findex* database, a new set of indicators to measure access to finance (account ownership, savings, borrowing, use of accounts…) by adults in 148 economies around the World. From the survey, fifty percent (50%) of adults of age 15 years and more in the world have an account at a formal financial institution. This percentage drops to 41% for the developing world and 23% for Africa. The most cited barriers to access to finance are the lack of money, the high costs of financial services, the physical distance to formal financial institutions, the lack of documentation and the lack of confidence in the financial institutions. In a parallel paper, Demirguc-Kunt and Klapper (2012b) provide a detailed description of financial inclusion in Africa. Their study show that Africa lags behind other developing world regions in terms of financial inclusion; they pointed the high cost, the physical distance and the lack of documentation to be the main obstacles to financial inclusion in Africa. These obstacles tend to dissipate as the per capita GDP increases, and are observed less in countries with a better competitive environment, opened, more market friendly, and with better regulated financial system with more transparent and developed information infrastructure. Allen et al. (2012) found more or less similar results. Indeed, these authors studied the individual and country characteristics associated to the use of formal financial accounts and the efficient policies for people more likely to be excluded from the formal financial system such as the poor and the people living in rural areas. Using a Probit model, they found that owning an account and frequent usage of accounts are associated to an environment more favorable to access to financial services, characterised by low account management costs, geographical accessibility of financial intermediaries, and less documentations requirements to open an account.

Beck and Cull (2013) studied the current state of Africa's banking system, particularly those in Sub-Saharan Africa, and discussed recent financial innovations that can improve traditional models used in Africa. They showed that Africa banking system has low depth but is stable. African banks are well capitalised and liquid, but lend less to private sector compared to banks in other developing regions. Moreover, households and enterprises are less likely to use

financial services in Africa than their pairs in other developing countries. In sum, Africa banking system has low depth compared to the rest of the world, and is less inclusive: in Africa there exist only 15 bank accounts per 100 adults, whereas it is 42 in the rest of the world. Moreover, only 21% of enterprises indicated to have used a credit line or have received a loan from a formal bank, this proportion is 43% out of Africa. Similarly, a median 16.5% of adults in Africa have indicated to own an account at a formal bank, this number is 21% elsewhere. According to the authors, the main reasons for the low development of Africa banking system are: (i) the small size of many economies, which doesn't allow financial service suppliers to gain economies of scale; (ii) also most enterprises operated in the informal sector, they do not have the legal documentation, which increases the costs and disqualifies many of them to access financial services; finally, (iii) the volatility due to unstable income and informality, but also the dependence of many African countries to exports, increases the cost and risk of management. Governance issues have also been mentioned.

Hence, less than a quarter of adults in Africa have an account at a formal financial institution. This low penetration rate of formal accounts in Africa calls for more attention on the alternative informal methods used by the populations for borrowing and savings. Exploring this idea, Klapper and Singer (2013) used the *Global Findex* database to study the informal methods used by the population to save and borrow. They found that the majority of adults in Africa used informal methods to save and borrow. According to them, close to 100 million adults in Sub-Saharan Africa use community-based savings methods such as rotating savings and credit associations, 38% of adults declared to have borrowed money from friends or family over the last 12 months. Using a Logit multinomial and Probit models, the authors showed that women, the poorest, the less educated, those living in rural areas and middle age adults are less likely to have a formal account. The results also showed that the employment status is a key determinant of owning an account. Adults employed by an employer are more likely to hold an account than those self-employed. At the same time, unemployed workers are less likely to own an account than independent workers.

One must therefore find optimal strategies to help the vulnerable groups excluded from the more secured formal financial system to access it progressively. One strategy can be the promotion of post offices. In that respect, Anson et al. (2013) studied the central role that can be played by post offices in the promotion of financial inclusion because of their accessibility and

widespread geographical location in rural and poor areas. Indeed, the *Global Findex* database showed that 12% of adults in developing countries have an account in post offices, the majority of these post office account holders are Africans (24%). Using a Logistic multinomial regression, Anson et al. (2013) showed that post offices are more likely than traditional financial institutions to provide an account to individuals from vulnerable groups such as the poorest, the less educated as well as the disabled.

Moreover, Allen et al. (2013) explored whether innovations in financial services, such as mobile banking services, can reduce the gap observed with regards to access to financial services in Africa. Indeed, the development of mobile banking in Africa started in Kenya with M-Pesa, which constitutes an easy and accessible way to transfer and receive money using mobile phones, especially for the poor and those living in remote areas. According to the *Global Findex* database, in 2011, 67% and 60% of adults in Kenya were using mobile phones to, respectively, receive and transfer money. This service has expanded throughout many other countries like Angola, the Democratic Republic of the Congo, Nigeria, Soudan and Uganda. To study the effect of mobile banking in the African financial sector, the authors conducted regressions using the Ordinary Least Squares (OLS) method using three dependent variables. These variables are essentially: the percentage of adults using a mobile phone to send money, to receive money, and to pay bills. In addition, they added dummy variables to control for the regions (in Asia and Africa). The results suggested that the penetration has been more pronounced in Sub-Saharan Africa than in other regions. Mobile banking has proven successful in receiving and sending money. Therefore, an important financial inclusion requires taking steps toward new approaches in terms of service delivery, such as mobile banking.

Despite these very interesting and up-to-date studies, to our knowledge no paper has studied the specific case of Central and West Africa, and conduct comparative analysis within these regions, in order to draw sound policy recommendations for the countries of the regions. Our study is filling that vacuum.

III. METHODOLOGY AND DATA

In this section, we present the methodology and the data used to conduct this study.

III.1. Methodology

Most papers in the literature, (see e.g. Allen et al. (2012)), use either a Probit or Logit model where the dependent variable is a combination of the following binary variables: "owning a formal account" (*Account*); "having saved in past 12 months" (*Saving*); "having borrowed in past 12 months" (*Borrowing*); and the frequency of account usage in a month (*Frequency*). For our analysis, we will use a modified version of this model: the « cluster specific fixed effect model », so called CSFE, a method that is well fitted for data with countries. In our model countries are defined as « clusters » (see e.g. Cameron and Trivedi, 2005).

The econometric model is presented as follows:

$$Y_{ij} = X'_{ij}\beta + Z'_{j}\gamma + u_{ij}\ , \qquad j = 1,..,J\ ;\ i = 1,\dots,1000, \tag{1}$$

where i is for individuals and j is for countries (« clusters »). Our database contains 10 countries in the ECOWAS region and 8 countries in the ECCAS region, with each having 1000 surveyed individuals. We assume that the country characteristics (Z_j) are fixed and constants. X_{ij} represents the vector of individual characteristics.

To better measure access to finance in our set of countries, we use four dependent variables to estimate the regression model (1); these four variables are:

1. *Account* (Own a formal account): which takes the value of 1 if individual *i* in country *j* owns a bank account at a formal financial institution, and 0 otherwise.
2. *Saving* (Have saved in the past 12 months): for individuals owning an account, it takes the value of 1 if individual *i* of country *j* has saved in the past 12 months, and 0 otherwise.
3. *Borrowing* (Have borrowed over the past 12 months): for individuals owning an account, it takes the value of 1 if individual *i* of country *j* has borrowed at his bank in the past 12 months, and 0 otherwise.
4. *Frequency* (The frequency of usage of the account in a month): for individuals owning an account, it takes the value of 1 if individual *i* of country *j* has performed at least three (3)

withdrawal operations[3] in his account in a given month, and 0 otherwise. These operations included cash withdrawal, electronic payments or purchases, checks, or any time money has been withdrawn from the account by the individual himself or others.

For each dependent variable, we define $Y_{ij} = \begin{cases} 1 & \text{if } Y_{ij}^* > 0 \\ 0 & \text{otherwise} \end{cases}$, where Y_{ij}^* is the latent variable associated to Y_{ij}. The estimation for the dependent variable "*Account*" is done using the entire population of the sample. For the other three dependent variables ("*Saving*", "*Borrowing*", and "*Frequency*"), the estimations are restricted to the population of individuals owning an account at a formal financial institution.

III.2. Variables and sources of data

We use mainly the survey data from the "Global Financial Inclusion", so called *Global Findex*, conducted in 2011 in 148 economies around the world and available at the World Bank.[4] Our sample will be restricted to eighteen (18) countries of Central and West Africa included in the database. Thus, the sample comprises ten (10) countries from the Economic Community of West African States (ECOWAS) region and eight (8) countries from the Economic Community of Central African States (ECCAS) (i.e. 18 000 observations with 1000 observations per country). The ECOWAS countries included in the sample are six (6) from UEMOA (Benin, Burkina Faso, Mali, Niger, Senegal and Togo) and four (4) from WAMZ (Ghana, Guinea, Nigeria and Sierra Leone).[5] The ECCAS sample is composed of five (5) CEMAC countries (Chad, Cameroon, Central African Republic, Congo and Gabon) and three (3) countries outside CEMAC (Angola, Burundi and the Democratic Republic of Congo).[6]

As in Allen et al. (2012) and Klapper and Singer (2013), we introduce socio-economic characteristics of the individuals, by assuming that they may be significant factors to explain

[3] This concerns only withdrawal operations, savings and borrowing have already being captured by the other variables above.

[4] See Demirguc-Kunt and Klapper (2012a) for a detailed description of the *Global Findex* database or visit the following website for more recent works on financial inclusion using this database: http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/EXTPROGRAMS/EXTFINRES/EXTGLOBALFIN/0,,contentMDK:23147627~pagePK:64168176~piPK:64168140~theSitePK:8519639,00.html.

[5] Our database does not contain data for two countries in UEMOA (Côte d'Ivoire, Bissau Guinea) and two countries in WAMZ (Gambia, Liberia).

[6] We do not have data for the following ECCAS countries: Equatorial Guinea (CEMAC member) and Sao Tome & Principe.

access to financial services or financial inclusion in the two regions. These variables obtained from the *Global Findex* database are:

- *Female* (0/1): indicates whether the respondent is a female or not, assuming that in Africa it is more difficult for women than men to own an account and to access financial services.
- *Education*: defines the education level with three modalities: primary or less education, secondary education, and tertiary and more education. We expect the education level to have a positive impact on the likelihood of using the financial services. Indeed, the more educated the individual is, more ability he has to understand most of the complexity of financial products.
- *Age*: refers to the age of the individual. Indeed, in many past studies, the young have been identified as a vulnerable group more exposed to poverty.
- *Age^2*: is the age squared. We assume that the use of financial services increases with age, but decreases at some age threshold. The age-squared captures this non-linear effect.
- *Income*: income quintiles are used to capture income level. We assume that the probability of owning an account increases with the income level. We consider five categories of income quintiles: Poorest (20%), Second poorest (20%), Third poorest (20%), Fourth poorest (20%) and Fifth poorest (20%).
- *Rural* (0/1)*:* dummy that takes the value of 1 if the respondent lives in a rural area and 0 otherwise. A rural area is defined as a town or rural village with less than 50,000 inhabitants. If this information is unavailable, a rural area is based on the interviewer's perception of whether a respondent lives in a rural area, on a farm, in a small town, or in a village. From the existing literature, access to financial services seems to be more difficult for people living in rural areas in Africa.
- *Employment Status:* indicates if the respondent is employed, unemployed or out of the workforce. Individuals who are employed are expected to have more easy access to financial services than those unemployed.
- *Marital Status*: indicates if the respondent is married, divorced, widowed or single.
- *Confidence in Financial Institutions* (0/1): dummy that takes the value of 1 if the respondent indicated to have confidence in the financial institutions or banks and 0 otherwise.

- *Log of Household Size*: the Logarithm of the household size. As argued by Allen et al. (2012), adults who live in larger households (including a spouse) are more likely to use someone else's account, and less likely to own their own account.

Table 1 below summarizes the variables descriptions and data sources.

Table 1 : Variables descriptions and sources of data

Variable	Description	Source of data
Account	The respondent owns (or not), alone or with someone, an account in a formal financial institution. It takes 1 if the individual owns an account, and 0 otherwise.	Global Findex
Saving	The respondent has (or not) saved in a formal account in the past 12 months. It takes 1 if the individual has saved in the past 12 months, and 0 otherwise.	Global Findex
Borrowing	The respondent has (or not) borrowed from a formal financial institution. It takes 1 if the individual has borrowed in the past 12 months, and 0 otherwise.	Global Findex
Frequency	The respondent has (or not) withdrawn money from his account at least 3 times in a typical month. It includes cash withdrawal, electronic payments or purchases, checks, or whenever money has been withdrawn from the holder account by him or others. It takes 1 if the individual has used the account as specified above, and 0 otherwise.	Global Findex
Female	Dummy that takes 1 if the respondent is a female, and 0 otherwise.	Global Findex
Education	Instruction level of the respondent: Primary education or less; Secondary education; and Tertiary and more.	Global Findex
Age	Age of the respondent in years.	Global Findex
Age^2	Age in years of the respondent squared.	Global Findex
Income Quintile	Income quintiles of the respondent: Poorest (20%), Second poorest (20%), Third poorest (20%), Fourth poorest (20%) and Fifth poorest (20%).	Global Findex
Rural	Dummy that takes the value of 1 if the respondent lives in a rural area and 0 otherwise.	Global Findex
Employment Status	The respondent is employed full-time or part-time (self-employed or by an employer), unemployed, or out of the workforce.	Global Findex
Marital status	The respondent is married, divorced, widowed or single.	Global Findex
Confidence in Financial Institutions	Dummy that takes the value of 1 if the respondent indicated to have confidence in the financial institutions or banks and 0 otherwise.	Global Findex
Log of Household Size	Logarithm of household size.	Global Findex

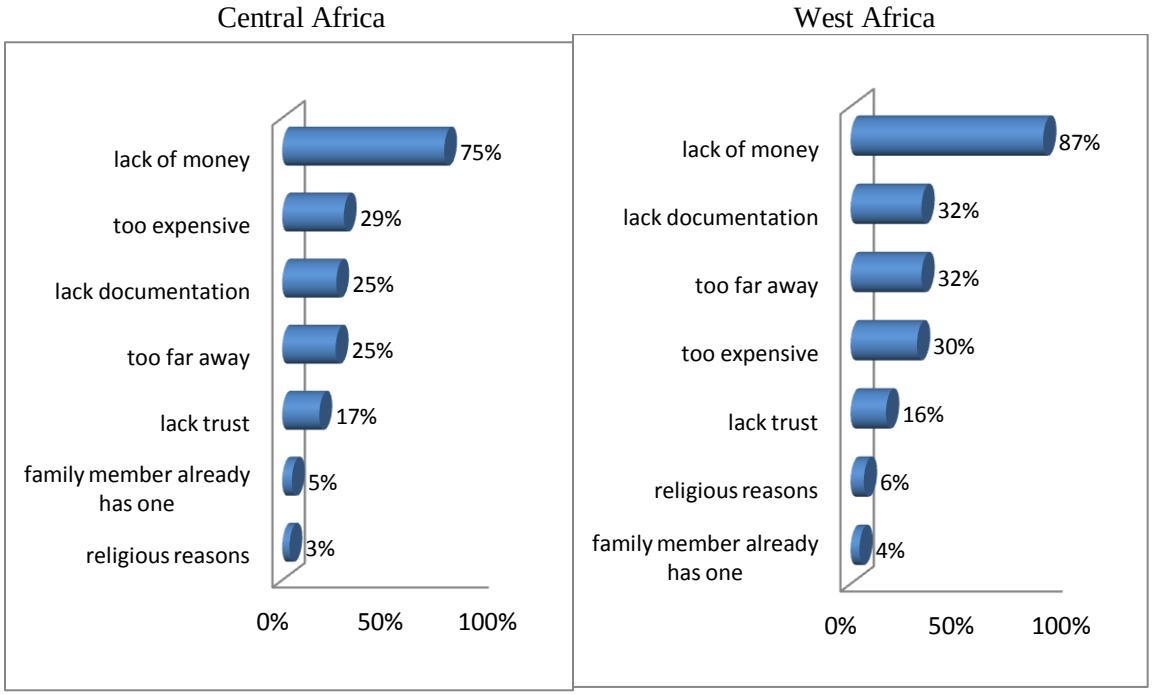
IV. OVERVIEW OF FINANCIAL INCLUSION IN CENTRAL AND WEST AFRICA

In this section, we provide an overview of the barriers to formal finance and financial inclusion in Central and West Africa and provide descriptive analysis of potential individual characteristics of financial inclusion. We also analyse the correlations between potential determinants of financial inclusion and the variables capturing access to financial services using the Khi-squared statistical test. In the next section, we will perform an econometric analysis to deepen our understanding of financial inclusion in these two regions.

IV.1. Barriers to formal finance in Central and West Africa

In Central and West Africa, lack or less liquidity is the key barrier to access formal finance (see Figure 1). This is followed, in Central Africa, by the high costs of financial services, the difficulty to obtain the requested documentation and the geographical implantation of banking offices in countries. Whereas in West Africa, the second barrier to access formal finance is the lack of documentation, followed by the geographical location of financial institutions, and the banks' services fees. These barriers are similar to the ones found across Africa.

Figure 1 : Barriers to access formal financial services in Central and West Africa



Comparison within each sub-regions of the two RECs reveals that barriers to access to formal finance are more or less in the same order within the two sub-zones of each region as shown in Table 2. However, in Central Africa, not enough money, lack of necessary documentation and too far away from financial institutions are more pronounced in CEMAC countries than in non-CEMAC zone; whereas in West Africa, not enough money, too far away from formal financial institutions and the lack of trust in financial institutions are more pronounced in UEMOA than in WAMZ. Note that CEMAC and UEMOA are two monetary zones.

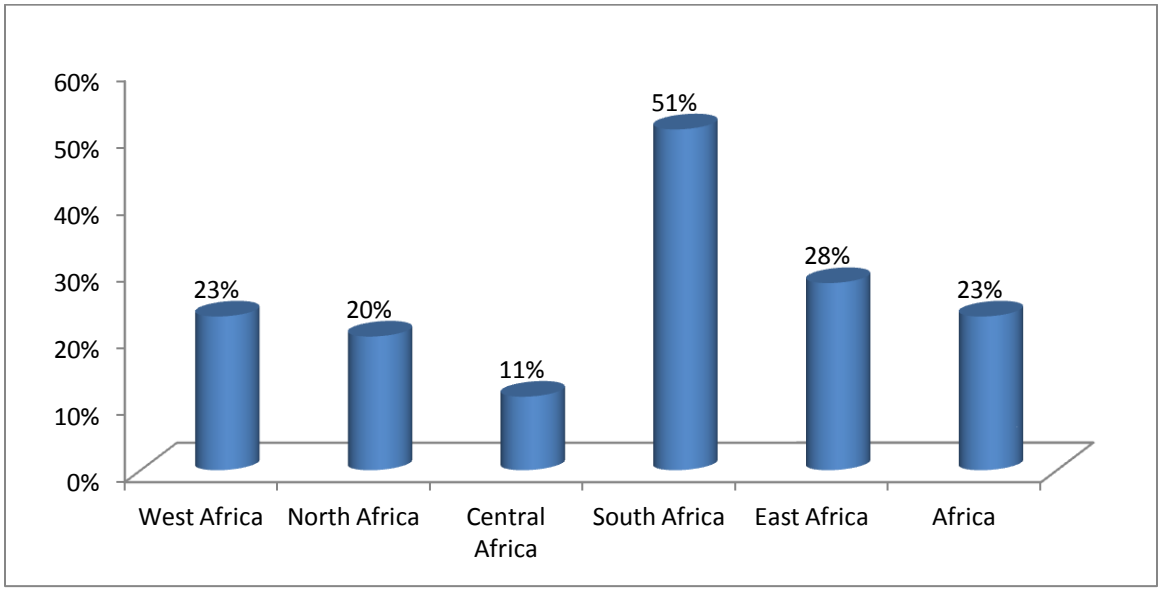
Tableau 2 : Barriers to financial inclusion in Central and West Africa

	ECCAS		ECOWAS	
Barriers	CEMAC	Non CEMAC	UEMOA	WAMZ
Family member already has an account	5%	4%	3%	6%
Not enough money	77%	72%	89%	84%
Lack of trust in financial institutions	17%	17%	17%	14%
Lack of necessary documentation	28%	20%	33%	32%
Financial services too expensive	27%	31%	30%	29%
Too far away from financial institutions	26%	23%	34%	29%
Religious reasons	3%	3%	6%	5%

IV.2. Access to finance in Central and West Africa

Figure 2 shows the proportion of adults with a formal account at a financial institution across Africa regions. The proportion of population owning an account at a formal financial institution is approximately 11% in Central Africa and 23% in West Africa. These proportion are relatively low when compared to South Africa (51%) and East Africa (28%) as shown in Figure 2. As mentioned above, Central and West Africa have some of the lowest financial inclusion rates in Sub-Saharan Africa.

Figure 2: Account penetration across Africa regions[7]



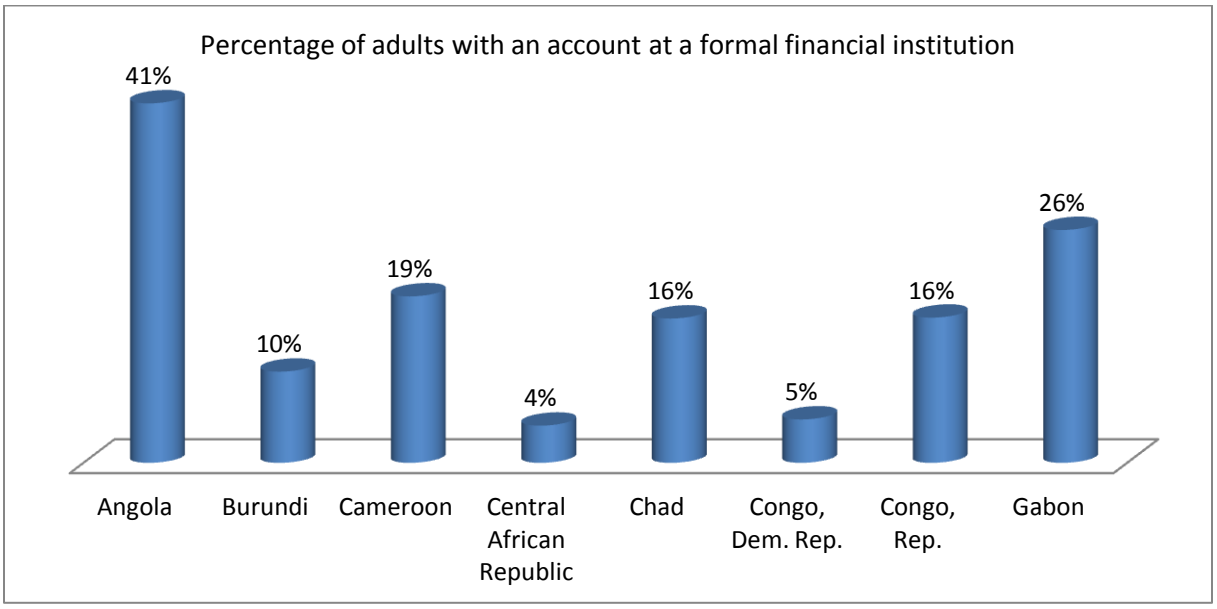
Source: Demirguc-Kunt and Klapper (2012b).

An analysis by country within each region shows that account penetration varies widely from country to country. We observe a big disparity in terms of account ownership within each region. In Central Africa for example, the rate varies from 4% in Central African Republic to 41% in Angola. In West Africa, it varies from 3% in Niger to almost 40% in Ghana and Nigeria as illustrated in Figure 3, with a predominance in the sub-region WAMZ.

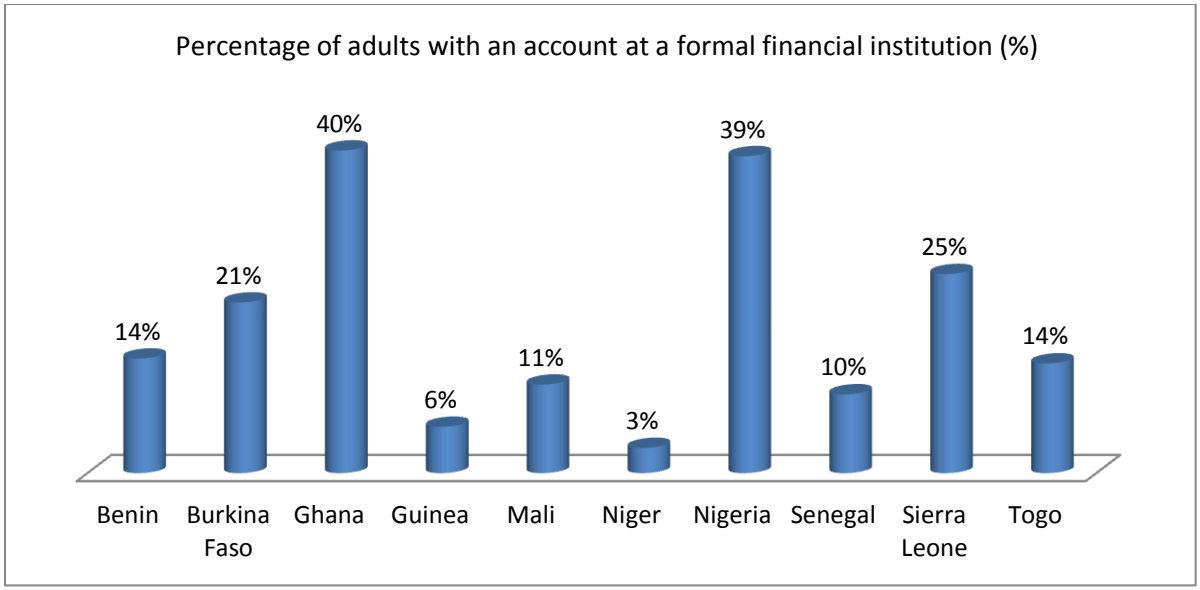
[7] These are adults with an account at a formal financial institution, including postal offices and microfinance institutions.

Figure 3 : Account penetration by country in Central and West Africa

Central Africa



West Africa



IV.3. Individual characteristics of financial inclusion

Here we provide a descriptive analysis of the potential determinants of financial inclusion in the two regions. For that purpose, we compare the distribution with respect to individual characteristics for account holders versus the alternative group of no account holders.

Potential determinants of "owning a formal bank account"

Figure 4 below shows the distribution of account ownership by individual characteristics: gender, education level, age, income quintile, residence area, employment status, marital status, and trust in financial institutions. The graphs of panel A (resp. panel B) are for Central Africa (resp. West Africa), with the distribution of individual characteristics provided for respondents with a formal account (left hand size graph) versus respondents with no bank account (right hand size graph). We observe that among adults with a formal account, the proportion of men is 56% in ECCAS versus 61% in ECOWAS. These proportions drop to 51% in ECCAS and 52% in ECOWAS for the group of respondents with no account. The percentage of respondents with an account who have attained at least the secondary or higher education level is nearly 75% in both regions. These percentages drop to only 47% in ECCAS and 27% in ECOWAS for the group of respondents with no account.

Respondents with an account are concentrated in the working age group (25-64 years old): it represents 73% of the population of account owners in ECCAS (resp. 78% in ECOWAS) versus 56% for the group without formal account in ECCAS (resp. 58% in ECOWAS). The young (15-24 years old) have less access to finance. The percentage of young respondents without an account is almost the double of that of young account holders (i.e. 40% versus 25% in ECCAS and 37% versus 19% in ECOWAS). The majority of respondents with a formal account (60% in ECCAS and 65% in ECOWAS) are in the two highest income quintiles versus only 36% in the group of respondents without a formal account. The percentage of respondents with a formal account living in urban areas (52% in ECCAS and 35% in ECOWAS) is almost double that of respondents without an account (27% in ECCAS and 16% in ECOWAS).

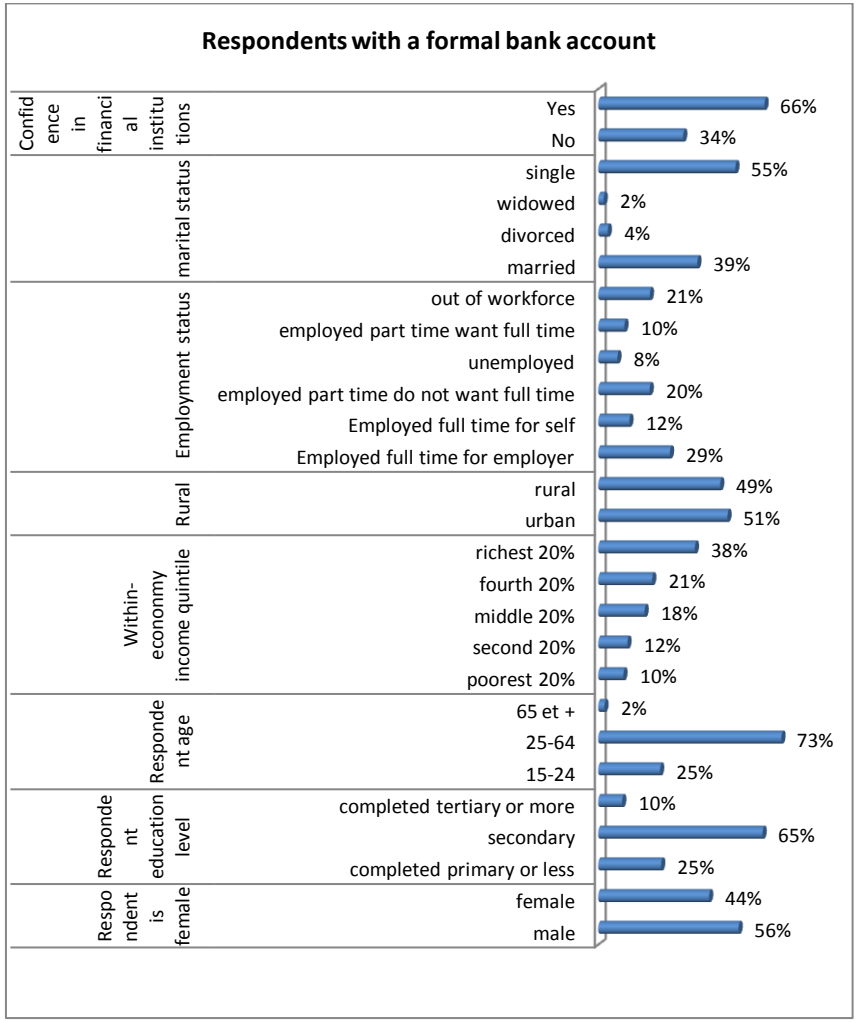
In ECOWAS, more than 61% of respondents with an account are full time employed, while this percentage is only 35% for the group of respondents with no account. In ECCAS, the percentage of full time employed among the account holders is 41%, this rate drops to 29% among no account holders. The majority of respondents with no account are out of the workforce (36% in ECCAS and 31% in ECOWAS). For the marital status, the distribution is more or less the same for no account holders and account holders. Finally, although the majority of respondents have confidence in the financial institutions, this percentage is higher for account

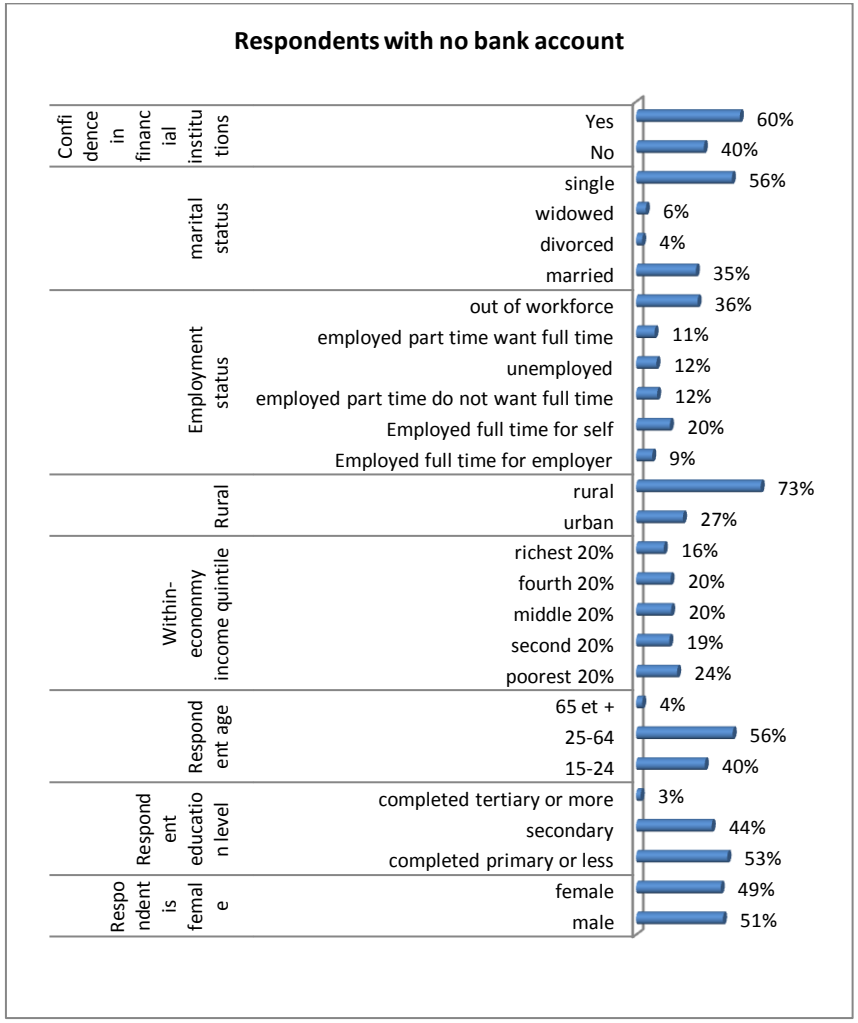
holders (66% in ECCAS and 78% in ECOWAS) than for no account holders (61% in ECCAS and 67% in ECOWAS).

From the above descriptive analysis, the respondent's sex, education level, age, income, residence area, employment status and degree of trust in the financial system seem to be important determinants of financial inclusion. We will conduct further analysis later by way of econometric regressions.

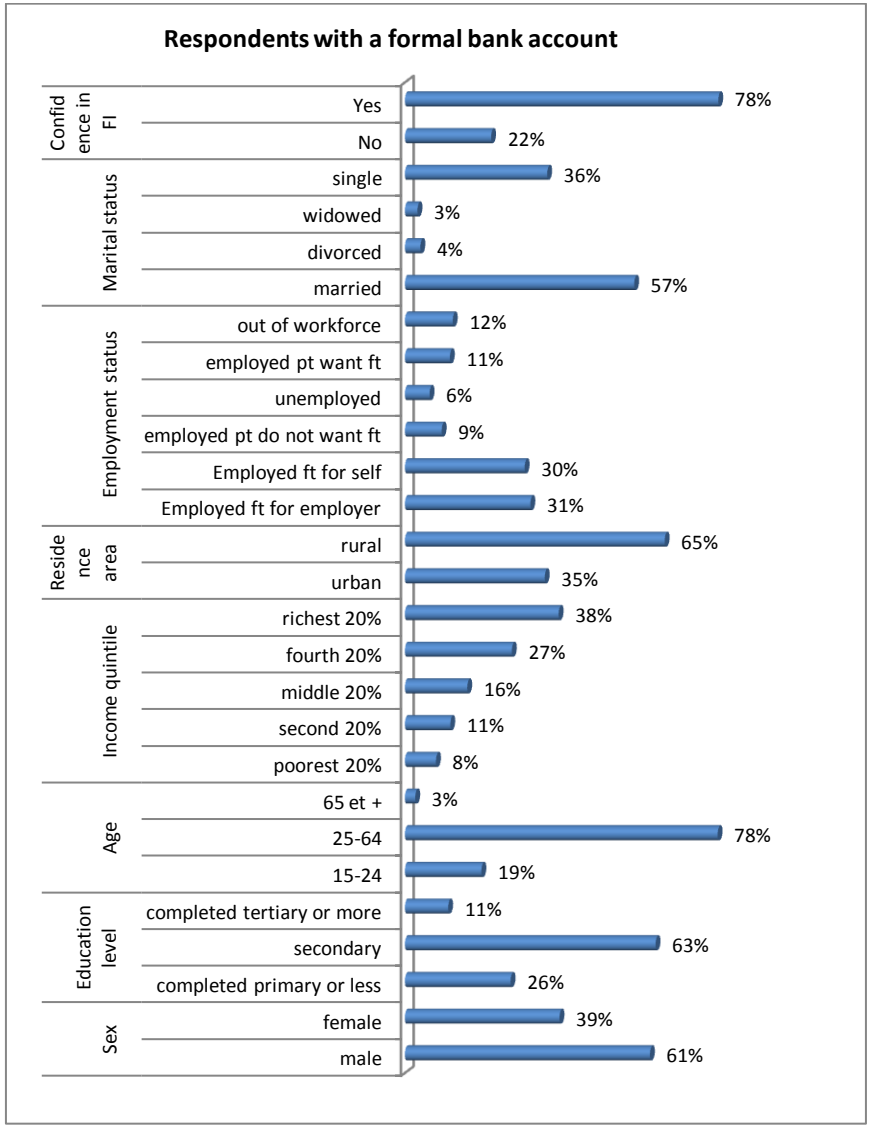
Figure 4: Account ownership by individual characteristics in Central and West Africa

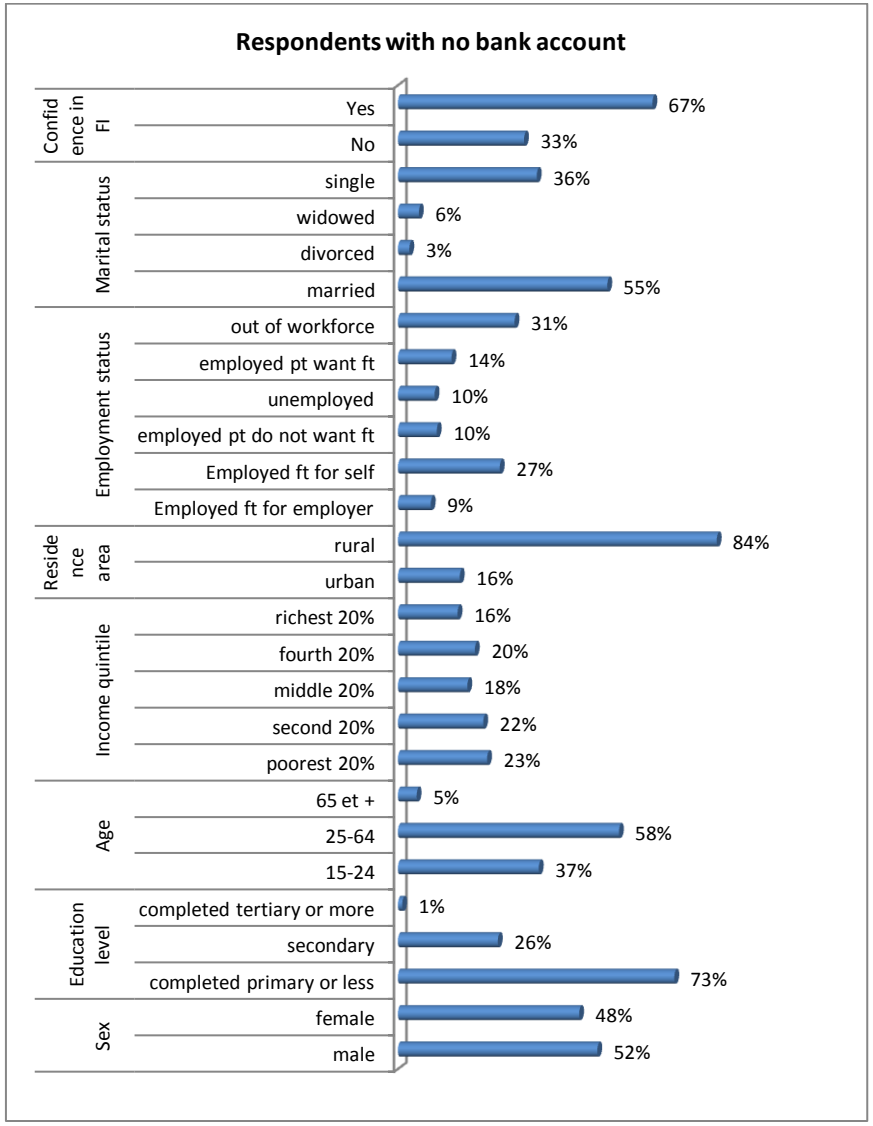
A. Account ownership by individual characteristics in Central Africa





B. Account ownership by individual characteristics in West Africa





Tables 3 provides the distribution of individual characteristics for the two regions and for the four indicators of financial inclusion. From the table, although we observe differences in the characteristics of respondents who have access to finance in Central and West Africa, the determinants of financial inclusion are more or less similar for the four financial inclusion indicators for each region, i.e. men, more educated, high income, working age, full-time employed and high degree of confidence in financial institutions are the main determinants of financial inclusion. Residence area and marital status also seem to be important determinants for financial inclusion.

Potential determinants of "having saved in past 12 months"

Now let's focus on the usage behaviour of those who own an account at a formal financial institution. The first usage indicator is saving in the account. Globally, 82% of respondents in West Africa, who own an account at a formal financial institution, have saved in the past 12 months preceding the survey. This proportion is only 69% in Central Africa and 79% in Sub-Saharan Africa as shown in Figure 5.

Also, as shown in Table 3, with regards to age, those who saved the most are aged between 25 and 64 years: 76.3% in Central Africa and 80.6% in West Africa of them owning an account have saved in the past 12 months. However, few elderly (65 years and more) do save: only 2.5% in Central Africa and 2.1% in West Africa of them have saved in the past 12 months using their formal account. These findings are not surprising, as the population in the age bracket 25-64 years is the working-age population. With regards to income quintile, saving increases with the respondent's income level. In both regions, 41% of account owners in the highest income quintile have saved in the past 12 months, and this percentage increases to 62.4% in Central Africa and 69.6% in West Africa for the two highest income brackets. For the gender of the respondent, men owning an account seem to save more than women (60.9% vs. 39.1% in Central Africa and 64.1% vs. 35.9% in West Africa).

Moreover, respondents who saved in the past 12 months are predominantly those who have attained the secondary education (67.9% in ECCAS and 63.5% in ECOWAS), only 21.5% in ECCAS and 24.6% in ECOWAS have the primary or no education and 10.6% in ECCAS and 11.9% in ECOWAS have attained the tertiary or more education level. Additionally, among the

respondents who saved in the past 12 months, 46.9% in ECCAS and 66.4% in ECOWAS lived in rural areas, 46.5% in ECCAS and 64.6% in ECOWAS are employed full time, 41% in ECCAS and 57.6% in ECOWAS are married. And finally, 70.1% in ECCAS and 79.5% in ECOWAS trust the financial system.

Overall the fundamental difference between the two regions is observed mainly with respect to the following three individual characteristics: residence area, employment and marital status, where the proportion of savers who are married, full-employed and/or lived in rural area is bigger for ECOWAS than ECCAS.

Potential determinants of "having borrowed in past 12 months"

We now analyse the behavior of respondents who have borrowed in the past 12 months. As shown by Figure 5, in Central Africa, 24% of respondents in our sample who own an account at a formal financial institution have borrowed from their institution in the past 12 months preceding the survey. This proportion reaches 25% of respondents in our sample for West Africa and 21% for Sub-Saharan Africa.

From Table 3, we observe that 77.3% in ECCAS and 83.6% in ECOWAS of those who have requested a credit during the past 12 months are aged between 25 and 64 years. The majority of them are among the richest in terms of income, 42.6% in ECCAS and 40.3% in ECOWAS are in the highest income quintile and 62.2% in ECCAS and 61.3% in ECOWAS are in the two highest income quintiles. Moreover, the statistics show that men have borrowed more than women (59.8 vs. 40.2 in ECCAS and 59.5% vs. 40.5% in ECOWAS); 61.5% in ECCAS and 48.1% in ECOWAS of borrowers have reached the secondary education level, 7.7% in ECCAS and 9.6% in ECOWAS have attained the tertiary education level and 30.8% in ECCAS and 42.2% in ECOWAS have primary or no education; 52% in ECCAS and 70.2% in ECOWAS lived in rural area; 43.4% in ECCAS and 59.5% in ECOWAS are employed full time; 48.2% in ECCAS and 69.1% in ECOWAS are married; and finally, 64.4% in ECCAS and 78.6% in ECOWAS have confidence in the financial system.

Therefore, those who have borrowed in the past 12 months are mainly men with secondary education level or more, from the working-age group 25-64, and with high income level. Likewise, they are, for the most, married, lived in rural areas and employed and trust the financial system. The proportion of population in the age group 25-64 years represents, in many

African countries, the most active population on the job market, hence more likely to obtain loans from financial institutions if they can prove that they have a job. Also, in Central and West African tradition, men are considered to be the head of the family; to accomplish this role, he may need to borrow from time to time to satisfy the basic needs of his family. At the same time, the education level increases the likelihood of owning an account, although, one may argue that the population with secondary education level may be more in the need for a credit than the population with tertiary or higher education level, given their income level which usually increases with the education level.

Again here also, there are some fundamental differences between the two regions with respect to the borrowing behaviour in terms of education level, residence area, employment status, marital status and level of confidence in the financial institutions. Indeed, more percent of borrowers in ECOWAS lived in rural areas, are full time employed, are married and have confidence in the financial institutions, whereas the proportion of educated borrowers in ECCAS is bigger than in ECOWAS.

Potential determinants of "the frequency of use of the account"

We now examine the frequency of usage of the account by respondents who have an account at a formal financial institution. Recall, here an individual is said to use frequently his account if he performs at least three (3) withdrawal/payments operations in his account in a typical month. These withdrawal/payments activities are: cash withdrawal, electronic payments and purchases, checks, or any other time money is withdrawn from his account by him or others. From Figure 5, it appears that 23% of respondents in ECCAS versus 20% in ECOWAS owning a formal account have used it frequently for withdrawal or payments operations. The proportion is 31% in Sub-Saharan Africa.

Generally speaking, we observe the same trend as the one observed for the other financial inclusion indicators, ownership of account, saving and borrowing as shown in Table 3; i.e. the active population (i.e. age range of 25-64 years) uses more frequently their account (69.6% in ECCAS versus 80.3% in ECOWAS). Also, the frequency of use of the account increases with the income level of the respondent; where 36.8% in ECCAS and 49.2% in ECOWAS of respondents in the highest income quintile use their account more frequently. This proportion increases to

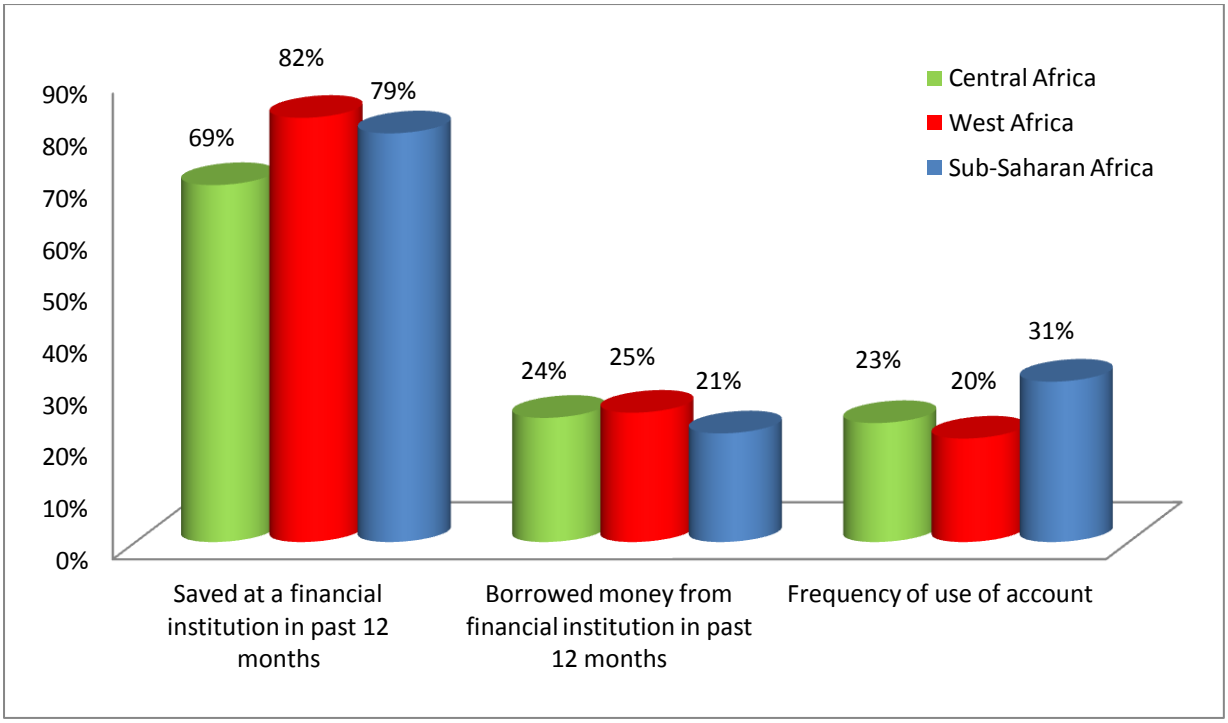
57.9% in ECCAS and 77.6% in ECOWAS when the two highest income quintiles are considered. Moreover, men use their account more frequently than women (53.2% vs. 46.8% in ECCAS and 66.9% vs. 33.1% in ECOWAS); 76.4% in ECCAS and 85.7% in ECOWAS of account holders who use their account more frequently have attained the secondary or more education level.

Finally, most account users are in rural areas in ECOWAS (53.4%) versus urban areas in ECCAS (51.5%), are full-time employed (66.6% in ECOWAS versus 33% in ECCAS), are married in ECOWAS (55.3% in ECOWAS versus 36.3% in ECCAS) and have confidence in the financial system (55.9% in ECCAS versus 79.2% in ECOWAS). However, the percentage in each category seems to be predominant in ECOWAS than in ECCAS.

Tableau 3 : Financial inclusion by individual characteristics in Central and West Africa

		Own an account at a formal financial institution		Saved at a financial institution in past 12 months		Borrowed money from financial institution in past 12 months		Frequency of use of account in a month	
		ECCAS	ECOWAS	ECCAS	ECOWAS	ECCAS	ECOWAS	ECCAS	ECOWAS
Respondent is female	male	55.9%	61.3%	60.9%	64.1%	59.8%	59.5%	53.2%	66.9%
	female	44.1%	38.7%	39.1%	35.9%	40.2%	40.5%	46.8%	33.1%
Respondent education level	completed primary or less	25.0%	26.5%	21.5%	24.6%	30.8%	42.2%	23.5%	14.4%
	secondary	65.4%	62.7%	67.9%	63.5%	61.5%	48.1%	64.8%	71.3%
	completed tertiary or more	9.50%	10.8%	10.60%	11.9%	7,70%	9.6%	11,60%	14.4%
Respondent age	15-24	24.60%	19.2%	21.20%	17.4%	19,90%	13.6%	29,10%	17.1%
	25-64	72.90%	78.3%	76.30%	80.6%	77,30%	83.6%	69,60%	80.3%
	65 et +	2.50%	2.6%	2.50%	2.1%	2,70%	2.8%	1,30%	2.5%
Within-econonmy income quintile	poorest 20%	10.00%	7.8%	8.30%	5.4%	12,70%	9.6%	14,00%	5.9%
	second 20%	11.60%	11.4%	10.20%	9.5%	9,10%	13.1%	10,40%	6.2%
	middle 20%	18.40%	15.6%	19.10%	15.5%	16,00%	15.8%	17,70%	10.4%
	fourth 20%	21.50%	26.8%	21.20%	28.7%	19,60%	21.2%	21,10%	28.4%
	richest 20%	38.50%	38.5%	41.20%	40.9%	42,60%	40.3%	36,80%	49.2%
Rural	urban	51.50%	35.0%	53.10%	33.6%	48,00%	29.8%	51,50%	46.6%
	rural	48.50%	65.0%	46.90%	66.4%	52,00%	70.2%	48,50%	53.4%
Employment status	employed FT for employer	28.50%	31.4%	31.30%	33.1%	28,80%	27.6%	23,60%	35.7%
	employed FT for self	12.4%	30.0%	15.2%	31.5%	14.6%	31.9%	9.4%	30.9%
	employed PT don't want FT	20.5%	9.2%	23.6%	10.2%	20.9%	10.3%	25.6%	9.0%
	unemployed	7.6%	6.2%	7.2%	5.4%	4.6%	4.4%	7.1%	5.3%
	employed PT want FT	10.4%	11.3%	10.1%	10.6%	13.6%	15.3%	9.4%	7.9%
	out of workforce	20.6%	12.0%	12.6%	9.1%	17.5%	10.5%	24.8%	11.2%
Marital status	married	39.5%	57.4%	41.0%	57.6%	48.2%	69.1%	36.3%	55.3%
	divorced	3.8%	3.9%	3.3%	4.4%	3.3%	5.5%	2.7%	5.1%
	widowed	2.1%	3.2%	2.2%	2.4%	2.6%	3.1%	0.0%	2.5%
	single	54.6%	35.6%	53.5%	35.6%	46.0%	22.3%	61.0%	37.1%
Confidence in FI	No	33.8%	21.6%	29.9%	20.5%	35.6%	21.4%	44.1%	20.8%
	Yes	66.2%	78.4%	70.1%	79.5%	64.4%	78.6%	55.9%	79.2%

Figure 5: Use of account in Central and West Africa



IV.4. Independence tests between the individual characteristics and the financial inclusion indicators

Here we compute the independence "Khi-squared" statistics to see if there is a statistical relationship between the financial inclusion indicators and the individual characteristics variables considered separately. From the results of the statistical tests presented in Table 4, we cannot reject the existence of non-zero correlation between the financial inclusion indicators and the individual characteristics such as the respondent's sex, education level, age, income quintile, residence area, employment status, marital status, and degree of confidence in financial institutions. We therefore conduct further investigation below by way of multivariate regressions.

Table 4 : Pearson Khi-squared test of independence between financial inclusion indicators and individual characteristics in Central and West Africa

	Central Africa				*West Africa*			
	Account	***Saving***	***Borrowing***	***Frequency***	***Account***	***Saving***	***Borrowing***	***Frequency***
Individual characteristics	Khi^2	Khi^2	Khi^2	Khi^2	Khi^2	Khi^2	Khi^2	Khi^2
Female	**12.393*** (0.000)**	**16.756*** (0.000)**	**2.744* (0.098)**	1.729 -0.189	**47.635*** (0.000)**	**11.92*** (0.000)**	0.83 (0.362)	**5. 09** (0.024)**
Education	**428.451*** (0.000)**	**11.116*** (0.004)**	**8.12** (0.017)**	1.867 -0.393	**1572.23*** (0.000)**	**8.56** (0.013)**	**79.1*** (0.000)**	**32.38*** (0.000)**
Age	**130.01*** (0.000)**	**7.623** (0.022)**	**5.16* (0.076)**	**5.84** -0.016**	**255.96*** (0.000)**	**12.56*** (0.002)**	**12.32*** (0.002)**	1.19 (0.552)
Income	**426.084*** (0.000)**	**11.474** (0.022)**	**9.558** (0.048)**	7.689 -0.104	**689.65*** (0.000)**	**48.529*** (0.000)**	**11.873** (0.018)**	**33.5*** (0.000)**
Rural	**306.78*** (0.000)**	1.875 (0.171)	2.03 (0.15)	0.04 (0.842)	**329.72*** (0.000)**	**3.084* (0.079)**	**7.348*** (0.008)**	**28.04*** (0.000)**
Employment status	**427.58*** (0.000)**	**60.686*** (0.000)**	**12.31** (0.03)**	**15.14** (0.01)**	**827.07*** (0.000)**	**40.495*** (0.000)**	**17.68*** (0.003)**	7.764 (0.17)
Marital status	**31.28*** (0.000)**	1.947 (0.583)	**12.01*** (0.007)**	**11.21*** (0.004)**	**21.57*** (0.000)**	**9.167** (0.027)**	**49.11*** (0.000)**	2.48 (0.479)
Confidence in FI	**15.67*** (0.000)**	**11.455*** (0.000)**	0.653 (0.419)	**19.743*** (0.000)**	**92.605*** (0.000)**	2.478 (0.115)	0.006 (0.936)	0.066 (0.798)

The signs ***, ** and * indicate the significance level at 1%, 5% and 10%, respectively. The p-values are given in parenthesis.

V. ECONOMETRIC ANALYSIS OF FINANCIAL INCLUSION IN CENTRAL AND WEST AFRICA

In this section, we conduct further analysis on the determinants of financial inclusion by way of econometric regressions. We use the variables described above along with the four financial inclusion indicators used as dependent variables. Table 5 below presents the regression results for the four indicators of financial inclusion for Central Africa and West Africa. In each regression, we control for the countries fixed effects. The model is estimated using either the Probit or the Logit estimation technique depending on the outcome of the Hausman test. For each column, the estimation technique is indicated.

Regression results with « Account » as dependent variable

With the financial inclusion indicator *Account* (« *owning a formal account* »), we find that, in Central Africa, all the individual characteristics are significant determinants of financial inclusion, the exception being the household size. Hence, the gender, the education level, the age, the income quintile, the residence area, the employment status, the marital status and the level of confidence in the financial institutions are all significant at least at the 5% confidence level. In West Africa, however, gender and marital status are not significant determinants of account ownership. These results confirm more or less the results obtained above in the descriptive analysis.

Clearly, the estimations show that female respondents are less likely to have an account than male respondents in Central Africa. The variable is not significant in West Africa. The likelihood of owning an account increases with the respondent's education level in both regions. Indeed, we observe that individuals having attained the secondary education level are two (2) times more likely to own a formal account in Central Africa than those with primary or no education. This probability increases to five (5) times in West Africa. Moreover, the attainment of a tertiary or more education level multiplies by almost seventeen (17) times in West Africa and by six (6) times in Central Africa the likelihood of owning an account compared to having only primary education or less. It is then more likely for people with higher education level to own a formal bank account. Age has a positive effect on the likelihood of account ownership, while age-squared coefficient is negative, confirming the existence of a threshold effect for the age variable. When the regression is re-run with the age

variable split by ranges,[10] we observe that being in the age range 25-64 years multiplies by almost two (2) times the likelihood of owning an account compare to respondents belonging to the age range of 15-24 years.

In addition, being in the highest income quintiles and living in urban areas increase the probability of owning an account. For example, being in the "fifth poorest" income quintile, multiplies by two (2) in Central Africa and by four (4) in West Africa the likelihood of owning a formal account. Adults living in rural areas have two (2) times less chance to own an account than those living in urban areas. Respondents unemployed or out of the workforce are less likely to own an account compared to full-time employed. Indeed, when compared to full-time employed by an employer, respondents have their probabilities of owning an account divided by nearly four (4) for those out of the workforce or unemployed.

In Central Africa, widowed or single persons are less likely to own an account compared to married individuals. The marital status variable has no significant impact on account ownership in West Africa. Adults having confidence in the financial system are most likely to own an account (odds-ratio of 1.39 in Central Africa and 1.66 in West Africa). Finally, the household size has a negative significant impact on the probability of having a formal account only in West Africa, not in Central Africa.

Thus, for the variable *Account*, the likelihood of owning a formal account in both regions is high for respondents with the following characteristics: more educated,[11] age range 25-64 years, high income level, living in urban areas, full-time employed and having confidence in the financial institutions. These individual characteristics, however, have different degree of impact on the likelihood of owning a formal account as indicated by their odds-ratios. In addition to that, the two regions have some main differences, in the sense that in Central Africa, being married and being a male seem to have positive impacts on the likelihood of owning an account, whereas it is not the case in West Africa. In West Africa, however, the income level and the size of the household seem to matter more.

Since previous studies such as Klapper and Singer (2013) have conducted this type of analysis for Africa using the same *Global Findex* database, in Table 6 we compare our results to theirs. We thus provide the signs and significance levels of the coefficients we obtained for both Central Africa and West Africa to their results for Africa as aggregate. We observe that

[10] For simplicity, we did not report the results with the age split, these results are available from the authors upon request.

[11] From our analyses, there is no perfect correlation between income quintiles and education level. Hence, we assume the two variables to be exogenous to each other in our analysis.

all the considered determinants of formal account ownership have the expected signs as the one obtained for Africa by Klapper and Singer (2013), except the gender and the marital status. These latter two variables do not seem to be significant determinants of formal account ownership in West Africa, whereas they are in Central Africa and Africa.

For the other financial inclusion variables used as dependent variables (i.e. those related to the usage of the formal account), we observe many differences between Central Africa and West Africa, and between these two regions and Africa taken as aggregate. Below we discussed those findings.

Regression results with « Saving » as dependent variable

With respect to the second financial inclusion indicator *Saving* (« *have saved at a formal financial institution in past 12 months* »), in Central Africa, the significant individual characteristics obtained from the estimated logit model are: income quintile ("*second poorest*") and employment status ("*employed part time don't want full time*" and "*out of the workforce*"). Indeed, as in the account ownership case, individuals out of the workforce are less likely to save. In West Africa, the significant individual characteristics are: education level, age, marital status ("*divorced*") and level of confidence in financial institutions.

Similar to the account ownership determinants, the results show that, in West Africa, respondents having attained at least the secondary education and aged between 25 and 64 years are more likely to save at a formal financial institution. For instance, having attained the tertiary and more education level multiplies by almost two (2) the likelihood of saving compared to those with primary or no education. Again, age-squared has a negative impact on the *Saving* variable, which confirms our hypothesis of non-linear relationship between age and the likelihood of financial inclusion. Divorced individuals are more likely to save than married ones in West Africa, although the significance level is weak at only 10%.

The comparison Table 6 shows that for the financial inclusion indicator *Saving*, while education level and age are significant individual characteristics for saving in West Africa and Africa, they are not in Central Africa. Income level is not a positive determinant of saving in neither regions, whereas it positively affects the likelihood of saving in Africa. The residence area is not significant in both regions for the *Saving* variable, even though, being a urban resident has been found to increase the probability of saving in Africa. Finally, while in Africa taken as aggregate, married respondents are more likely to save, this is not the case for the two regions under study.

Regression results with « Borrowing » as dependent variable

Concerning the third dependent financial inclusion variable *Borrowing* (« *having borrowed at a formal financial institution in past 12 months* »), from the Probit model estimations, in Central Africa, the individual characteristics which are significant are: education level, income quintile, employment status and marital status. In West Africa, the significant determinants are: education level, age, income quintile ("*second poores*t"), marital status ("*single*") and household size.

There are some common individual characteristics in the two regions with different degree of impact. These common determinants are: education level, income level and marital status. In both regions, we observe that respondents with higher education level and higher income quintiles are less likely to borrow. One can argue that respondents with higher education or in higher income quintiles are less in need of credit than those less educated or in the lowest income quintiles. Concerning the marital status, widowed respondents in Central Africa and singles in West Africa are less likely to borrow than married respondents.

Each region, however, has additional significant determinants which are not necessarily significant in the other region. For instance, in Central Africa, we observe that part-time employed are more likely to borrow than full-time employed. In West Africa, the demand for credit increases with the age and the household size, with a threshold effect for age. Hence, Adults in the active age range 25-64 years are more likely to demand credit than those in the age range 15-24 years.

The comparative analysis presented in Table 6 shows that education and income level have negative impacts on the likelihood of borrowing in Central Africa and West Africa, whereas these two variables impact positively the likelihood of borrowing in Africa as aggregate. Age is a significant determinant for borrowing in West Africa and Africa, but not in Central Africa.

Regression results with « Frequency » as dependent variable

Finally, for the last dependent variable *Frequency* ("*frequency of use of account in a typical month*"), in Central Africa, the following individual characteristics appear as significant determinants: education level, marital status, level of confidence in financial institutions and household size. In West Africa, instead, the significant determinants are: gender, education level, residence area, income quintile, employment status and marital

status. For this financial inclusion indicator, the two regions have two significant individual characteristics in common: education level and marital status. On the one hand, respondents with high education are more likely to use more frequently their account for money withdrawal and payments in both regions. Indeed, improving the education level from primary to secondary education increases considerably the frequency of use of the account with an odds-ratio of 1.6 for the two regions, and from primary to tertiary education level the odds ratio becomes 3.5 for Central Africa and 1.83 for West Africa. On the other hand, respondents who are divorced or single are less likely to use their account more frequently than married individuals.

In addition, in Central Africa, those who have more trust in the financial system and those living in bigger household are less likely to use their account more frequently. In West Africa, moving from the « first poorest » income quintile to the « fifth poorest » multiplies by almost two (2) the chance of using more frequently the account. Moreover, full-time self-employed in this region are more likely to use their account more frequently for cash withdrawal and payments than full-time employed by an employer (the odds-ratio is 1.45). Finally, women (versus men) and those living in rural areas (versus urban areas) are less likely to use their accounts more frequently.

For this last indicator of financial inclusion *Frequency*, we do not have the results for Africa, as this variable have not been used by Klapper and Singer (2013). We therefore compare only results for Central Africa and West Africa in Table 6. As we have mentioned, the gender is a significant determinant of the use of the account in West Africa, with the likelihood of using more frequently the account higher with men than women. Education has a positive significant impact on the frequency of account usage in both regions. Income is positively significant only at 10% in West Africa, but not in Central Africa. Individuals living in urban areas are more likely to use their account more frequently, and the coefficient is significant at the 5% level in West Africa, but it is not significant in Central Africa. Full-time self-employed has a significant positive impact on the frequency of use of the account in West Africa, but not in Central Africa. Being divorced in Central Africa or being single in West Africa decreases significantly the likelihood of using the account more frequently. Finally, the level of confidence and the size of the household have significant negative impacts on the frequency of use of the account in Central Africa, but have no significant impacts in West Africa.

In sum, all the individual characteristics identified in the previous section, have being found to be significant determinants of at least one of the financial inclusion indicators, with the most dominant one being: education, age, income, residence area, employment status, level of confidence in financial institutions, marital status and household size. These determinants have significant coefficients in the first regression with the dependent variable *Account* and in at least one of the other three regressions involving one usage of the account (saving, borrowing or frequency of use). Nonetheless, their impacts are different from region to region and depending on the financial inclusion indicator used.

Tableau 5: Individual determinants of financial inclusion in Central Africa and West Africa

	Central Africa				West Africa			
	Account	***Saving***	***Borrowing***	***Frequency***	***Account***	***Saving***	***Borrowing***	***Frequency***
Individual characteristics	Model = Logit	Model = Logit	Model = Probit	Model = Logit	Model = Logit	Model = Logit	Model = Probit	Model = Logit
Female	**-0.133*** **	-0.00329	0.0324	0.145	0.0766	-0.00226	0.0681	**-0.302*** **
	(0.0497)	(0.467)	(0.113)	(0.186)	(0.0808)	(0.252)	(0.104)	(0.0881)
Education: "Secondary"	**0.677*** **	0.122	-0.123	**0.482*** **	**1.655*** **	**0.404* **	**-0.160** **	**0.486** **
	(0.263)	(0.197)	(0.142)	(0.169)	(0.0666)	(0.209)	(0.0787)	(0.246)
Education: "Tertiary and more"	**1.854*** **	0.165	**-0.753*** **	**1.259** **	**2.827*** **	**0.663** **	**-0.238* **	**0.606*** **
	(0.360)	(0.520)	(0.178)	(0.492)	(0.327)	(0.270)	(0.138)	(0.128)
Age	**0.0638*** **	0.0157	0.00544	-0.00919	**0.122*** **	**0.0556* **	**0.0484** **	0.0294
	(0.0127)	(0.0223)	(0.0153)	(0.0286)	(0.0130)	(0.0306)	(0.0212)	(0.0412)
Age^2	**-0.000619*** **	8.96e-05	0.000129	-0.000259	**-0.00121*** **	**-0.000706** **	**-0.000624*** **	-0.000416
	(0.000119)	(0.000285)	(0.000177)	(0.000245)	(0.000121)	(0.000335)	(0.000234)	(0.000466)
Income: "2nd poorest"	0.0282	**-0.453*** **	**-0.429* **	-0.293	0.152	-0.0585	**-0.298*** **	-0.154
	(0.272)	(0.169)	(0.242)	(0.194)	(0.164)	(0.456)	(0.0868)	(0.350)
Income: "3rd poorest"	0.156	0.0802	**-0.292* **	-0.128	**0.532*** **	0.183	-0.155	-0.202
	(0.125)	(0.649)	(0.159)	(0.331)	(0.0686)	(0.226)	(0.147)	(0.236)
Income: "4th poorest"	0.0604	0.293	**-0.468* **	-0.631	**0.848*** **	0.0970	-0.324	0.175
	(0.0965)	(0.343)	(0.247)	(0.425)	(0.127)	(0.367)	(0.223)	(0.232)
Income: "5th poorest"	**0.825** **	0.127	-0.237	0.114	**1.322*** **	0.696	-0.137	**0.630* **
	(0.401)	(0.585)	(0.252)	(0.313)	(0.0943)	(0.448)	(0.127)	(0.332)
Rural	**-0.863*** **	-0.00178	-0.0864	-0.461	**-0.755*** **	0.139	0.0350	**-0.570** **
	(0.267)	(0.300)	(0.124)	(0.306)	(0.134)	(0.195)	(0.120)	(0.237)
Employment Status: "Employed FT for Self Employed"	-0.411	0.170	0.0115	0.504	**-0.594*** **	0.250	-0.0866	**0.370** **
	(0.295)	(0.384)	(0.313)	(0.663)	(0.140)	(0.253)	(0.188)	(0.146)
Employment Status: "Employed PT don't want FT"	-0.255	**0.998*** **	0.286	0.223	**-0.727*** **	0.245	0.0707	-0.0296
	(0.291)	(0.264)	(0.203)	(0.203)	(0.194)	(0.292)	(0.160)	(0.273)
Employment Status: "Unemployed"	**-1.684*** **	-0.446	-0.555	-0.0228	**-1.436*** **	-0.274	-0.0546	-0.282
	(0.197)	(0.348)	(0.406)	(0.257)	(0.242)	(0.359)	(0.357)	(0.373)

Employment Status: "Employed PT want FT"	-0.208	-0.441	**0.218*** **	0.327	**-0.698*** **	-0.216	0.164	-0.268
	(0.285)	(0.509)	(0.0637)	(0.689)	(0.190)	(0.347)	(0.161)	(0.330)
Employment Status: "Out of workforce"	**-1.368*** **	**-0.794** **	-0.120	0.0507	**-1.609*** **	0.117	-0.183	0.330
	(0.186)	(0.338)	(0.297)	(0.337)	(0.208)	(0.339)	(0.190)	(0.251)
Marital Status: "Divorced"	-0.562	-0.615	-0.130	**-0.887** **	-0.195	**1.130* **	0.330	0.365
	(0.373)	(0.833)	(0.397)	(0.365)	(0.393)	(0.662)	(0.307)	(0.344)
Marital Status: "Widowed"	**-0.567*** **	-0.685	**-1.133*** **	_	-0.251	-0.615	-0.260	0.117
	(0.152)	(0.924)	(0.332)		(0.200)	(0.474)	(0.234)	(0.216)
Marital Status: "Single"	**-0.289** **	0.463	0.101	-0.507	-0.221	0.161	**-0.254** **	**-0.391*** **
	(0.147)	(0.287)	(0.308)	(0.327)	(0.201)	(0.211)	(0.121)	(0.124)
Confidence in Financial Institutions	**0.332*** **	0.493	-0.152	**-0.521** **	**0.507*** **	**-0.468*** **	0.0895	-0.0197
	(0.103)	(0.422)	(0.217)	(0.214)	(0.142)	(0.166)	(0.127)	(0.188)
Log of Household Size	-0.0960	-0.240	-0.0869	**-0.429*** **	**-0.147** **	0.0377	**0.232*** **	-0.223
	(0.217)	(0.165)	(0.153)	(0.141)	(0.0665)	(0.247)	(0.0427)	(0.175)
Constant	-0.336	-0.874	-0.875	**1.565** **	**-4.308*** **	0.127	**-1.686*** **	**-1.364* **
	(0.590)	(0.558)	(0.589)	(0.624)	(0.323)	(0.722)	(0.536)	(0.703)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of observations	5 914	676	932	864	9 961	1 414	1 803	1 769
r2_p	0.265	0.157	0.116	0.192	0.305	0.103	0.130	0.106

Note: The signs ***, ** and * indicate the significance level at 1%, 5% and 10%, respectively. The standard errors are in parenthesis. The estimations are done using the countries as « clusters ».

Tableau 6: Comparative analyses between Central Africa, West Africa and Africa

Individual characteristics	*Account*			*Saving*			*Borrowing*			*Frequency*	
	ECCAS	ECOWAS	Africa	ECCAS	ECOWAS	Africa	ECCAS	ECOWAS	Africa	ECCAS	ECOWAS
Female	-***	+	-*	-	-	-	+	+	+	+	-***
Education: "Secondary"	+***	+***	+***	+	+*	+***	-	-**	+***	+***	+**
Education: "Tertiary and more"	+***	+***	+***	+	+**	+***	-***	-*	+***	+**	+***
Age	+***	+***	+***	+	+*	+***	+	+**	+***	-	+
Age^2	-***	-***	- ***	+	-**	-***	+	-***	-***	-	-
Income: "2nd poorest"	+	+	+	-***	-	+***	-*	-***	+	-	-
Income: "3rd poorest"	+	+***	+***	+	+	+***	-*	-	+***	-	-
Income: "4th poorest"	+	+***	+***	+	+	+***	-*	-	+***	-	+
Income: "5th poorest"	+**	+***	+***	+	+	+***	-	-	+***	+	+*
Rural	-***	-***	-***	-	+	-***	-	+	+	-	-**
Employment Status: "Employed FT for Self Employed"	-	-***	-***	+	+	-***	+	-	-***	+	+**
Employment Status: "Employed PT don't want FT"	-	-***	-***	+***	+	-***	+	+	-***	+	-
Employment Status: "Unemployed"	-***	-***	-***	-	-	-***	-	-	-***	+	-
Employment Status: "Employed PT want FT"	-	-***	-***	-	-	-***	+*	+	-***	-	-
Employment Status: "Out of workforce"	-***	-***	-***	-**	+	-***	-	-	-***	+	+
Marital Status: "Divorced"	-	-	-***	-	+*	-***	-	+	+	-**	+
Marital Status: "Widowed"	-***	-	-***	-	-	-***	-***	-	-***		+
Marital Status: "Single"	-**	-	-***	+	+	-***	+	-**	-***	-	-***
Confidence in Financial Institutions	+***	+***		+	-***		-	+		-**	-
Log of Household Size	-	-**		-	+		-	+***		-**	-

Note: The signs ***, ** and * indicate the significance level at 1%, 5% and 10%, respectively. Results for Africa are from Klapper and Singer (2013).

VI. CONCLUSION AND RECOMMANDATIONS

Inclusive finance is important to achieve inclusive growth in Africa in general, and in Central and West Africa in particular. These two regions have the lowest bank penetration rates in Sub-Saharan Africa. In this paper, we identify and analyse the determinants of financial inclusion in Central Africa and West Africa. We find that access to formal finance in the two regions is mainly determined by individual characteristics such as: the gender, the education level, the age, the income level, the residence area, the employment status, the marital status, the size of the household and the degree of confidence in financial institutions. Conducting a comparative analysis on the coefficients associated to the individual characteristics, we were able to highlight the differential impacts of these variables for Central Africa, West Africa and Africa. We also find that depending on the financial inclusion indicator being used, the individual characteristics have different degree of impacts for each region. These contrasting findings are very helpful for decision makers in order to design tailored made policies.

Based on these findings, we strongly recommend to policy makers, especially in the ECCAS region, to ease access to finance for women, the youths and the other vulnerable groups of the society. This can be done by promoting the benefits of using the formal financial services in schools and local communities and associations. For example, the government can encourage the youths and women to open accounts at formal banks by depositing their bursary and governmental family allocations in their bank accounts. There is also a need to alleviate conditions to open an account for these vulnerable groups of population, for instance, by simplifying the documentation requirements and reducing the financial services fees. Nowadays, with the increasing number of mobile phones users among the population in these countries, financial services providers have a good opportunity to create accessible financial products and services which better respond to the specific needs of these different groups.

Secondly, governments and their development partners should encourage and facilitate access to education, by reducing or even abolishing school registration and other schooling fees, and also creating conducing environment for the youth to continue their studies at higher education level. Finally, countries in the two regions should adopt more aggressive stable jobs

creation policies; this will certainly increase the income level of households and then facilitate access to formal financial services.

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