Financial inclusion gaps between formal and informal beneficiaries in Cameroon: does ethnicity-based social capital matter?

Écarts d'inclusion financière entre les bénéficiaires formels et informels au Cameroun : le capital social basé sur l'ethnicité est-il important ?

TANGWA Mark Wiykiynyuy[1]
TAPCHE Ndam Younous Fozoudine[2]

Abstract: This paper examines the financial inclusion gap between formal and informal beneficiaries in Cameroon using the 2017 Finscope survey. Specifically, the paper (a) measures the marginal effect of ethnicity-based social capital on financial inclusion and (b) assesses the relative contribution of ethnicity-based social capital in explaining the components of the financial inclusion gaps between formal and informal beneficiaries. Thus, a binary Probit model and Fairlie decomposition technique were used. We find that households belonging to an ethnic group association are more inclined to save and borrow from an informal financial service provider as compared to their formal counterparts. Decomposition results show that rural households are significantly less likely to have a formal account, formal savings, formal credits and informal savings but more likely to access informal credits. Also, formal beneficiaries witnessed gender disparities in favour of male while informal beneficiaries witnessed gender disparities in favour women. However, women are more likely to resort to informal fi-

[1] Faculty of Economics and Management, University of Yaounde II (Cameroon). Center for equity, wellbeing and development studies Cameroon (CEWDS-CAM). Email: tangwamark@yahoo.co.uk

[2] Faculty of Economics and Management, University of Yaounde II (Cameroon). Email: younousndam13@gmail.com

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nancial providers for financial needs. Policy implication suggests: the nurturing and encouragement of traditional cultures, kinship, and identity; Formal financial institutions should increase branches in areas with diverse ethnic associations especially in rural areas.

Keywords: Financial inclusion, Social capital, Ethnicity, Formal and informal.

Résume : *Cet article examine l'écart d'inclusion financière entre les bénéficiaires formels et informels au Cameroun à l'aide de l'enquête Finscope 2017. Plus précisément, le document mesure l'effet marginal du capital social fondé sur l'ethnicité sur l'inclusion financière (a) et évalue la contribution relative du capital social fondé sur l'ethnicité en expliquant les composantes des écarts d'inclusion financière entre les bénéficiaires formels et informels (b). Ainsi, un modèle binaire Probit et une technique de décomposition Fairlie ont été utilisés. Nous trouvons que les ménages appartenant issus d'un groupe ethnique sont plus enclins à épargner et à emprunter auprès d'un fournisseur de services financiers informels. Les résultats de la décomposition montrent que les ménages ruraux sont plus enclins à avoir un compte formel, une épargne formelle, des crédits formels et de l'épargne informelle, mais plus susceptibles d'accéder à des crédits informels. En outre, parmi les bénéficiaires formels, les disparités sont en faveur des hommes, tandis que parmi les bénéficiaires informels, les disparités sont en faveur des femmes. Cependant, les femmes font plus recours à des services financiers informels pour leurs besoins financiers comparativement aux hommes. Les implications politiques suggèrent : l'entretien et l'encouragement des cultures traditionnelles, de la parenté et de l'identité ; Les institutions financières formelles devraient augmenter leurs branches dans les zones avec diverses associations ethniques, en particulier dans les zones rurales.*

Mots-clés *: Inclusion financière, Capital social, Ethnicité, Formel et informel.*
JEL Code : O16 ; O17.

1. INTRODUCTION

The submerging role of the financial sector in spurring inclusive growth, entrepreneurship, reducing income inequalities and the prevalence of poverty has led to renewed enthusiasm in financial inclusion (FI). However, the challenge of financial access still remains a major concern as more than 2,5 billion adults are still excluded from the financial system mostly in developing countries (World Bank, 2014). However, despite the extensive reforms in the financial sector and the prominent role of financial inclusion in the achievement of the United Nations'17 sustainable development goals by 2030, most sub-Saharan African countries still witnessed a severe financial access gap (Kuada, 2019). Without being able to access an inclusive financial system, it becomes tricky to set up an investment for entrepreneurship and being resilient during any economic eventualities through savings accumulation. Financial inclusion in this context means that individuals and businesses have access to useful and affordable financial products and services delivered in a responsible and sustainable way in other to meet their needs (World Bank, 2021).

In developing countries, poor households may have access to financial services without making use of it for multiple reasons. This could be accounted for by; credit constraint prevails due to absence of collateral and high degree of information asymmetry on borrowers' creditworthiness or reimbursement capacities in the credit market (Biggs et al., 2002; Epo, 2012; Mwangi and Ouma, 2012; Metseyem, 2020). Also, high transaction costs may prevent households from saving in formal financial institutions by then inciting individuals to rely on informal financial providers for savings. These issues may even be more accentuated for low-income ru-

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ral individuals or female households compared to urban dwellers or male households due to financial development gap (in terms of penetration) in developing countries. However, reforms of financial inclusion factors considering only the economic sphere may not give the right approximated picture of financial inclusion level. Moreover, given the existence of inherent non-economic factors such as social capital which greatly influence the financial behaviour of individuals (World Bank, 2014).

Many scholars underlined the crucial role of social capital[3] in financial access notably through information sharing between networks' membership which reduces transaction costs (Biggs et *al.*, 2002; Gilchrist and Kyprianou, 2011; Epo, 2012; Mwangi and Ouma, 2012; Metseyem, 2020). Given the importance placed by developing countries on ethnicity[4], its caption as a social capital construct has not yet been assessed. Ethnic ties or network is often at the base of a social capital formation. This is because ethnic ties are highly correlated with certain levels of trust related exchanges and reciprocity between individuals in a heterogeneous society (Anthias, 2007). Therefore, ethnic-based association or community's social capital includes resources available to households through their membership in that group (Glorgas, 2000).

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[3] Bourdieu (1986) defines social capital as the advantages and opportunities emerging to individuals through membership in certain communities. Social capital can also be assimilated in this context as the level of connections among individuals characterised by a social organisation based on trust, reciprocity, norms and networks to facilitate action and cooperation for mutual benefits (Putnam, 1993).

[4] The concept of Ethnicity generally designates any human community constructed around a homogeneous social and economic structure and a unity based on a language, specific culture and a collective consciousness (Weber, 1958).

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Ethnic association or community's social capital is a grouping of persons based on ethnic or community ties who combine their efforts to defend the interests of a specific ethnic, community or individual member. In a context where financial access is constrained by the absence of collateral and information asymmetry, a voluntary group association based on ethnic ties and trust can provide vital practical support and thus serves as a collateral and aid to access financial information by every member in need (Gilchrist and Kyprianou, 2011). Ethnicity can therefore be considered as a powerful tool to sustain social capital (Bates and al., 1998).

The term ethnic or ethnicity therefore serves in this study as a factor that facilitates the convergence of individuals toward a common objective thus resulting to a social capital network effect. Membership of a group or association has commonly been used in empirical studies to proxy social capital (Fafchamps, 2000; Mwangi and Ouma, 2012). This article, which falls in line with Bourdieu (1986) and Putnam (1993) definitions of social capital, we proxy ethnicity-based social capital (EBSC) by ethnic group association membership. Their definitions were essentially based on the advantages and opportunities resulting from individuals' group affiliation or membership of an association.

Cameroon is characterised by a significant ethnic diversity and financial practices (Valente et *al.*, 1997). This diversity suggests that ethnic heterogeneity should be taken into account along key dimensions of ethnicity, which would help refine our analysis (De Walque et *al.*, 2017; Kim et *al.*, 2020). However, ethnic diversity in Cameroon has increased the playing ground for informal financial providers. In line with Abidin et *al.* (2019), informal financial inclusion originates when resource mobilization is through friends, family and in-

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formal savings clubs while formal financial inclusion stands for resource mobilization through legal entities such as banks and recognized financial institutions. These entities are known as formal/informal financial providers while households who benefit from these resources are known as formal/informal financial beneficiaries (FinScope, 2017; Vichet, 2019).

In Cameroon, it has been noticed that members of the same ethnic group form informal (formal[5]) meetings based on trust and custom. These groups often raise huge sums for the community and individual development. This has greatly encouraged the formation of ethic associations due to its benefits. The growing important role of these associations notably in the management and distribution of financial resources has stimulated Cameroon to establish and adopt a financial bill[6] which introduced a third tax regime on non-profit organisation in 2022. This implied levying tax on ¨njangi¨ and ¨tontines¨. The latter often known as informal financial providers are often ethnic social constructs and usually function as a closed social grouping or association.

The Cameroon's financial sector is well noticed in history of its weak impact especially after the 1980s financial crisis and the recurrent issues of information asymmetry, absence of collateral and low financial literacy of the poorer population in the financial market (Wamba and Sebigunda 2014). According to FinScope 2017, Cameroon still lags behind other African countries with a high-rate of financial exclusion[7] of about 36

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[5] Formal if the group meeting is legalized or recognized by the government

[6] Article 93 of the General Tax Code

[7] Financial exclusion stands for adult population not using any financial product from formal or informal mechanism

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percent of the total adult population (15 years and above) as compared to Rwanda (11 percent), Uganda (15 percent) and Kenya (17 percent) among others. In this way, about two-fifth of the Cameroon's population are cut-off from using formal and informal financial mechanisms for financial needs.

Specifically, in terms of the zone of residence about 49 percent of rural adult population are financially excluded while only 23 percent of urban adult population are financially excluded. Of these, 29 percent are formal and 22 percent are informally financially included in the rural areas, while 69 percent are formal and 8 percent are informal financially included in the urban areas (FinScope, 2017). In terms of gender, about 47 percent of the total female population are formally included, 16 percent are informally included and 37 percent are excluded. While 53 percent of the total male population are formally included, 13 percent informally included and 34 percent are financially excluded (FinScope, 2017). This shows the importance of informal financial inclusion as complement to formal FI in rural areas and female population compared to their urban and male counterparts respectively.

During the last decades, there have been some important empirical studies carried out in Africa and other developing regions showing that social capital (measured by association or a network membership) and some other households' socio-economic characteristics are crucial factors of informal and formal FI in terms of access to credit or savings strands (Fafchamps, 2000; Biggs et *al.*, 2002 ; Karlan, 2007; Mwangi and Ouma, 2012; Baidoo et *al.*, 2018). Most studies have revealed common socioeconomic households' differences in explaining rural-urban and gender FI gaps (Musa et *al.*, 2015; Ghosh and Chaudhury, 2019; Ndoya and

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Tsala, 2021). However, empirical studies exploring the correlation of ethnicity-based social capital (EBSC) on both formal and informal FI are inexistent. Moreover, the contribution of ethnicity-based social capital as a possible construct in explaining rural-urban gap and gender gaps in both formal and informal FI has not yet being explored.

Metseyem (2020) analyses social capital effects on households' access to microcredit in Cameroon, but emphasis was not laid on ethnicity-based social capital but only households access to formal microcredit strand was taken into account. Ndoya and Tsala (2021) on their part examine the socio-economic drivers of the gender gap in financial inclusion in Cameroon, but this study omitted the informal FI strand and the difference in ethnic association membership was not taken into account. Hence, this study fills the gap in the literature by analyzing the correlation between ethnicity-based social capital and FI considering formal and informal angles. This can permit a more comprehensive and holistic understanding of financial access and usage disparities and the sustained need for government to introduce tax regimes. This study equally fills the gap in the literature by exploring the contribution of ethnicity-based social capital differences in explaining the residence and gender gaps.

The aim of this study is therefore to examine the financial inclusion gap between formal and informal beneficiaries in Cameroon using the 2017 Finscope consumer survey. Specifically, the paper, on the one hand, measures the marginal effect of ethnicity-based social capital on financial inclusion and on the other, assesses the relative contribution of ethnicity-based social capital in explaining the components of the financial inclusion gaps between formal and informal beneficiaries.

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The rest of the paper is organized as follows. The second section provides an overview of related literature review, the third section provides an overview of data, and delineates the methodology, the fourth section presents the empirical results and fifth section outlines the conclusion and policy implications.

2. LITERATURE REVIEW

The study of ethnicity has a long history on both economics and sociology literature. However, the implications of ethnicity as a social capital seem widespread. Early studies on cross-country analysis in the developing world examined the effects of ethnicity on poor politico economic performance, growth, bureaucratic quality and governance quality (Easterly and Levine 1997) . Recent decades saw a renewed enthusiasm on the potential channels through which ethnicity factor may influence financial inclusion at the microeconomic sphere. Biggs et al. (2002) argued that relationships between members of an ethnic social capital network will constitute a means through which better information flows allowing the individuals to evaluate each other and the availability of informal enforcement mechanisms which serve to lower transaction costs in the financial market. In the same vein, La Ferrara (2002), argued that networks based on ethnicity can provide assurance, ease transactions and increase trust between individuals from the same group. Consequently, in developing countries where information asymmetry prevails in the credit market, loans can be granted depending on the individuals' ability to build up social capital and not according to the reimbursement ability in the credit domain. This is because social capital network can function as a social collateral or assurance against default risk by ensuring that individuals

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fulfil their obligations (Guiso et *al.,* 2004; Chai et *al.,* 2018).

Empirical evidence from previous studies exploring the interactions between ethnicity-based social capital or a multidimensional social capital factor and financial components converge to similar conclusions. La Ferrara (2002), explicitly focused on ethnic heterogeneity and found that ethnicity influence financial components through individual's preference in an economy making used of an original dataset on production cooperatives in the informal settlements in Kenya. Still in the Kenyan context, Biggs et *al.* (2002), show that being a member of an ethnic group significantly explains access to informal sources of finance like credit. Karlan (2007), used the Peruvian microfinance contextual perspective to show that, groups with greater levels of social connection that depend on ethnicity and geographical proximity, have lower default risk and higher saving rates, which therefore favors demand and supply of financial services. Mishra and Tripathi (2017), investigated the presence of cultural and ethnicity bias in access to bank credit by tribal entrepreneurs and discrete choice model. Their findings clearly show that ethnicity is an important determinant of access to bank credit.

On the broad social capital strands, Giné and Karlan (2007), found out that a high density and strength of social networks facilitate the flourished of microfinance in a field experiment in the Philippines. In the same vein, Newman et *al.* (2012) found that membership of high quality social capital networks leads to higher formal savings in rural Vietnam. Wamba and Sebigunda (2014), on their own part found a positive effects of social capital on banks' credit access using a sample of 413 small and medium enterprises in Cameroon. Still in Cameroon, Metseyem (2020) shows that

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social capital actually increased the probability of households having access to micro-credit. Some empirical studies also underlined the role of social capital in the informal FI in the developing context. Mwangi and Ouma (2012) used a bivariate probit model and found that social capital enhances financial inclusion by increasing access to informal credit in Kenya. Moreover, Chai et *al.* (2018), showed that social network increased the probability of households' participation in the informal market. They further argue that it augments the size of informal financial transactions and raises the ratio of informal lending in the rural and urban areas of China.

Recent empirical studies have also explored the existence of rural-urban and gender financial inclusion gaps. Sui and Niu (2017), used a large household survey data and found a rural-urban formal financial inclusion gap in China. They underlined differences in the level of education, income, financial literacy among others as most socioeconomic variables explaining the gap. Musa et *al.* (2015) found the existence of a gender FI gap in favour of male households and differences in the level of education and income as highest variables explaining the gap in Nigeria. Ghosh and Chaudhury (2019), equally found evidence on gender formal FI gaps and differences in the level of employment and education as predominant socio-economic factors explaining the gap. Moreover, similar empirical study by Ndoya and Tsala (2021), also concluded the existence a gender formal FI gap in Cameroon with differences in education and income as largest contributors in explaining the gap.

This study can be differentiated from the aforementioned studies in three folds. First, ethnic association membership is used as a dimension of social capital

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network[8] which is often neglected in financial analysis particularly in Cameroon where social capital plays a prominent role in the distribution of capital resources (Mayoux, 2001; Epo, 2012; Wamba and Sebigunda, 2014; Metseyem, 2020). Secondly, this study analyses the correlation of ethnicity-based social capital with different dimensions of financial inclusion (i.e. access and usage) so as to give a broader magnitude correlation of ethnicity-based social capital and thirdly, this study assesses the contribution of ethnicity-based social capital in explaining rural-urban as well as gender gaps in formal and informal FI in Cameroon. This study thus fills the gap in social capital and financial inclusion literature since the role of ethnicity-based social capital in financial inclusion remains terra incognita in Cameroon.

However, the existence of exact mechanism through which ethnic affiliation may affect financial inclusion outcomes is difficult to prove. The reason being, it requires a study to have more information about applicants and lack of econometric techniques to isolate ethnicity-based social capital effect from other effects on the financial behaviors of individuals. For instance, difficulty is to disentangle cultural or traditional ties from network effects, since they can both generate ethnicity effects on the demand and supply side of financial inclusion (Fafchamps, 2000).

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[8] Social network is an important indicator of social capital, characterised by a particular relationship formed and maintained by integrative and stable kinship, friend, neighbourhood, territorial ties (Putnam 1993)

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3. METHODOLOGY AND DATA

3.1 Econometric Approach

3.1.1. Probit Regression Model

Financial inclusion determinants have so far been modelled using either the logistic model or the probit model (Potrich et *al*., 2015). These models follow the discrete choice models which relate the choice made by each to the attributes of the person and the attributes of the alternatives available to the individual. Discrete choice models specify the probability that an individual chooses an option among a set of alternatives. The probabilistic description of discrete choice behavior is used not to reflect individual behavior that is viewed as intrinsically probabilistic. According to Greene (2012), logit and probit models are similar in most applications but their estimated coefficients are not directly comparable.

The application of a probit model is thus appropriate to identify the influence of ethnicity-based social capital on formal and informal financial inclusion in Cameroon. The choice of the probit model over the other binary response models was based on both convenience and the limitations of other models. It was suggested that a logistic approach is traditionally preferred since the function does not require the evaluation of an integral and thus the model parameters could be estimated faster. However, this argument is no longer relevant given the computational speeds now achievable and choice of one specification rather than the other is now usually arbitrary (Greene, 2012). The probit model used to assess the influence of ethnic social capital on the probability to access financial inclusion indicators is described by the following function:

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$$P_i = \text{Prob}(Y_i = 1|x) = F(z) = F(\beta_0 + x\beta) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}(\frac{z^2}{\sigma})} = \Phi(z) \qquad \textbf{(1)}$$

We note Φ as the repartition function of the centred and reduce normal law $N(0, 1)$. F is the cumulative distribution of the standard normal variate ε.

$$z = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots \ldots + \beta_p x_{ip} \ldots \qquad \textbf{(2)}$$

Where x_{ij} is the jth predictor for the ith person with ethnicity-based social capital and other control variables. So β_j is the jth coefficient and p is the number of predictors.

The probit model is used to determine the relationship between ethnicity-based social capital (EBSC) factor in both formal and informal FI strands as in equation (3):

$$P(X = 1/x) = \Phi[\beta_0 + \beta_1(\text{EBSC}) + \beta_2(\text{Age}) + \beta_3(\text{Age})^2 +$$
$$\beta_4(\text{Gender}) + \beta_5(\text{Household Size}) + \beta_6(\text{Emploment}) +$$
$$\beta_7(\text{Residence}) + \beta_8(\text{DFI}) + \beta_8(\text{Education}) +$$
$$\beta_9(\text{Marital status}) +$$
$$\beta_{10}(\text{Income}) \qquad (3)$$

Where X stands for the dependent variables (i.e. MFI account ownership, access to Micro Saving and microcredit), EBSC variable stands for household ethnic group association membership. Other independent variables are best described in Table A1 in the Appendix.

Given that the probit model is a non-linear format of binary response model; it cannot be estimated by Ordinary least square (OLS) method. While the parameters could, in principle be estimated using non-linear least square (NLS), maximum likelihood (ML) is simpler and provides efficient estimators for many applications and in regressions with dependent binary variables (Greene, 2012). The ML estimators are consistent and asymptot-

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ically distributed following a normal law. To obtain the ML estimation, conditional on the explanatory variables, we have as density the centred and reduced normal law of Y_i, given X_i. Note has to be taken that the parameter estimates of the probit model only provide the sign directions (positive or negative) of the independent variables with respect to the dependent variables. Thus, the estimates represent neither the actual magnitude of change nor the probabilities. Instead, the marginal effects are used to measure the expected change in the probability of a particular technique being chosen with respect to a unit change in an independent variable from the mean.

Lastly, this study equally runs bivariate probit regression models as a robustness test to check the stability of the results. The choice of this model is based on the fact that it provides more robust results in the presence of sample selection bias. It equally presents more accurate parameters in cases of two steps discrete probabilities (Greene, 2012;Mwangi and Ouma, 2012). The bivariate probit model was then explored to examine the factors (including EBSC) that affect the probabilities of a household's response of currently saving or borrowing (indebted) and the probability of household precisely saving or indebted from a formal or an informal institution financial provider given that these decisions are correlated.

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3.1.1. Fairlie Decomposition Approach

To analyse the contributions of EBSC and other independent variables in explaining the area of residence (Rural-Urban) gap and gender gap outcomes of FI in Cameroon, this study adopts a Fairlie nonlinear decomposition approach. This decomposition approach is an extension of Blinder-Oaxaca decomposition technique aimed at resolving issues tied to discrete variable used in nonlinear models such as probit or logistic models (Fairlie, 2006). Oaxaca (1973) and Blinder (1973) were the first to introduce the decomposition technique aimed at decomposing the deviations observed between two populations (men and women or rural and urban population) partly explained by the observable characteristics of these two groups that are a composition effect and a part explained by the differences in the estimated coefficients (Sinning et *al.*, 2008). The Blinder-Oaxaca decomposition technique is generally applicable for linear regression models and non-binary outcome variables. The Fairlie nonlinear decomposition technique thus appears more appropriate for this study and more robust than other non-linear decomposition technique especially in the presence of substantial differences in the independent variable (Boutchenik et *al.*, 2019). The Fairlie nonlinear decomposition for the residence gap can be specified as:

$$\overline{Y}^U - \overline{Y}^R = \left[\sum_{i=1}^{N^U} \frac{F(X_i^U \widehat{\beta}^U)}{N^U} - \sum_{i=1}^{N^R} \frac{F(X_i^R \widehat{\beta}^U)}{N^R}\right] + \left[\sum_{i=1}^{N^R} \frac{F(X_i^R \widehat{\beta}^U)}{N^R} - \sum_{i=1}^{N^R} \frac{F(X_i^R \widehat{\beta}^R)}{N^R}\right] \dots (4)$$

Equally, the Fairlie nonlinear decomposition for the gender gap can be specified as:

$$\overline{Y}^M - \overline{Y}^F = \left[\sum_{i=1}^{N^M} \frac{F(X_i^M \widehat{\beta}^M)}{N^M} - \sum_{i=1}^{N^F} \frac{F(X_i^F \widehat{\beta}^M)}{N^F}\right] + \left[\sum_{i=1}^{N^F} \frac{F(X_i^F \widehat{\beta}^M)}{N^F} - \sum_{i=1}^{N^F} \frac{F(X_i^F \widehat{\beta}^R)}{N^F}\right] \dots (5)$$

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Where N^j is the sample size for the type of residence j (U=urban and R=rural) in equation (4) and the gender j (M=male and F=female) in equation (5). $\overline{Y}^j$ stands for the average probability of binary outcome of the interest group (residence and gender) in both equation (4) and (5). F is the cumulative distribution function from the normal distribution, $\widehat{\beta}^j$ in both equations represents the vector of coefficients estimates for the type of residence and sex including a constant term.

The first term in brackets in equation (4) and (5) represents the part of the residence gap and gender gap in financial inclusion that is due to group differences in the distribution of independent variables. The second term stands for the part due to differences in the group (residence or gender) processes determining the level of financial inclusion (Y). This second term in both latter equations also captures the part of the residence or gender gap due to group differences in unmeasurable or unobserved endowments. This study follows the footsteps of Fairlie (2006) and Ghosh and Chaudhury (2019) to weight the first term of the decomposition expression using coefficient estimates from a pooled sample of two sample groups (in terms of residence and gender). Specifically, this study uses coefficient estimates from a probit regression that include a sample of all residence groups (rural and urban) and gender groups (male and female).

To identify the contribution of group differences in EBSC and other independent variables to the rural-urban gap and gender gap, we resort to further calculations by assuming X includes two independent variables (X_1 and X_2) and $\hat{\beta}^*$ as coefficient estimates from a probit regression for pooled samples to explain the gaps (Fairlie, 2006). The independent contribution of X_1 to the rural-urban gap can be expressed as:

$$\frac{1}{N^R}\sum_{i=1}^{N^R} F(\hat{\alpha}^* + X_{1i}^U\hat{\beta}_1^* + X_{2i}^U\hat{\beta}_2^*) - F(\hat{\alpha}^* + X_{1i}^R\hat{\beta}_1^* + X_{2i}^U\hat{\beta}_2^*) \qquad (6)$$

Similarly, the independent contribution of X$_2$ to the rural-urban gap can be expressed as:

$$\frac{1}{N^R}\sum_{i=1}^{N^R} F(\hat{\alpha}^* + X_{1i}^R\hat{\beta}_1^* + X_{2i}^U\hat{\beta}_2^*) - F(\hat{\alpha}^* + X_{1i}^R\hat{\beta}_1^* + X_{2i}^R\hat{\beta}_2^*) \qquad (7)$$

In terms of gender, the contribution of X$_1$ to the gender gap can also be expressed as:

$$\frac{1}{N^F}\sum_{i=1}^{N^F} F(\hat{\alpha}^* + X_{1i}^M\hat{\beta}_1^* + X_{2i}^M\hat{\beta}_2^*) - F(\hat{\alpha}^* + X_{1i}^F\hat{\beta}_1^* + X_{2i}^M\hat{\beta}_2^*) \qquad (8)$$

Similarly, the contribution of X$_2$ to the gender gap can be expressed as:

$$\frac{1}{N^F}\sum_{i=1}^{N^F} F(\hat{\alpha}^* + X_{1i}^F\hat{\beta}_1^* + X_{2i}^M\hat{\beta}_2^*) - F(\hat{\alpha}^* + X_{1i}^F\hat{\beta}_1^* + X_{2i}^F\hat{\beta}_2^*) \qquad (9)$$

The contribution of each variable to the respective gaps is thus equal to the change in the average predicted probability from replacing rural or female distribution with urban or male distribution of a specific variable while holding the distributions of the other variables constant. As it is assumed, this decomposition approach includes a one-to-one matching of cases between the four subsamples (rural and urban/female and male). In consideration of our context, the respective number subsamples are not identical. This study draws random rural and female subsamples with or without replacement equal to the sizes of the full urban and male samples. This is to match the samples by their respective rankings in the predicted probabilities. This study thus uses the mean value of all these separate decomposition

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estimates as an approximation decomposition for the entire rural sample and female sample.

3.2. Data

To understand the correlation of EBSC with financial inclusion in the Cameroon's context, this study draws on a nationally-representative data from the FinScope Consumer survey[9] of 2017. The Fin Scope Consumer Survey is an important component of the MAP[10] methodology as it is a demand tool that assists in determining the levels of financial access in a country. The survey focused on the demand side of financial inclusion, collecting information on the financial lives of adult individuals in Cameroon. Finscope Consumer survey sampling framework and data were conducted by the national institute of statistics (NIS, 2017) in 2016 to understand the adult population financial services consumption. This includes 6826 completed face-to-face interviews of the adult population aged 15 years and older at the regional and urban/rural level from October-November 2017. The interviews include individuals working in both the formal and informal Sectors.

3.2.1. Dependent variables

This study used the access and usage dimensions as indicated by Sarma (2012) and Demirguc-Kunt et *al.* (2013) as dependent variables and ignored the quality dimension due to data constraints. The access dimension here is proxied by account ownership and the usage by household savings and credit. This study consid-

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[9] The FinScope survey is a tool developed by FinMark Trust. The institution in charge of the data collection on field was the National Institute of Statistics of Cameroon.

[10] MAP is a diagnostic and programmatic framework to support expanding access to financial services for individuals and micro or small businesses

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ers at least two FI dimensions because limiting the measurement of FI to access strand does not permit accurate understandings on the frequency and rate of financial account usage by the beneficiaries (Allen et *al.*, 2016)

To better appreciate this study, financial inclusion indicators were viewed considering only the microfinance institution (MFI) angle as formal FI and informal savings groups (commonly known as "njangi" or "tontine") or informal money lenders as informal indicators of FI (Demirguc-Kunt et *al.*, 2013). This study limits the formal FI strand to MFI because it constitutes an important financial inclusion's instrument, presents a high penetration rate in Cameroon and being commonly underlined as the nearest pro-poor financial institution in the social capital literature (Epo, 2012; Wamba and Sebigunda, 2014; Fouopi and Kuindja, 2015; Metseyem, 2020). The choice of saving groups ("njangi" or "tontine") as the informal strand is based on the fact that they are the most important informal financial providers in Cameroon (Mayoux, 2001;Epo, 2012;Metseyem, 2020).

These dependent variables are all captured as binary outcomes. We attribute a value of one if a financial beneficiary possessed a MFI account, holds formal savings and have been indebted during the last 6 months in a MFI and zero otherwise. The same binary outcomes' attribute is applied on the informal strands as indicated in **Table A1** of the appendix.

3.2.2. Independent variables

As the independent variable of interest, EBSC is proxy by an ethnic group association membership. Membership of a group or association has commonly been used in empirical studies to proxy social capital due to ad-

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vantages and opportunities resulting from individuals' group affiliation or membership of an association (Fafchamps, 2000; Mwangi and Ouma, 2012). As a qualitative variable with two outcomes, EBSC takes the value of one if the financial beneficiary belongs to a tribal/ethnic regional and village associations, 0 otherwise in this study. Other independent variables include age, gender, household size, employment, area of residence, distance to the nearest MFI, level of education, marital status and income level of the financial beneficiary. Detailed descriptions of how these socio-economic variables are measured in this study are infolded in **Table A1** of the appendix.

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Table 1.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variables					
Account Ownership	6826	0.0951	0.2933	0	1
Formal Savings	6826	0.0861	0.2806	0	1
Formal Credit	6826	0.0119	0.1083	0	1
Informal Savings	6826	0.2587	0.4379	0	1
Informal Credit	6826	0.1339	0.3406	0	1
Currently Saving	6826	0.4804	0.4997	0	1
Currently Borrowing	6825	0.2756	0.4469	0	1
Independent Variables					
EBSC	6826	0.1371	0.3440	0	1
Age	6826	36.5032	16.3469	15	95
Age Squared	6826	1599.667	1476.32	225	9025
Gender (female)	6826	0.5134	0.4999	0	1
Household Size	6825	4.6341	3.1561	1	30
Employment	6826	0.6708	0.4699	0	1
Area of Residence (rural)	6826	0.5460	0.4979	0	1
Distance to MFI (in Min)	6826	0.3005	0.4584	0	1
Level of Education	6826	0.4936	0.4999	0	1
Marital Status	6826	0.5218	0.9956	0	1
Income Level	6826	0.3805	0.4856	0	1

Source: *computed by author from the finscope consumer survey Cameroon 2017 dataset.*

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4. ECONOMETRIC RESULTS AND INTERPRETATION

4.1. Descriptive Statistics

Table 1.1 presents the summary of the descriptive statistics for the variables used in this study. Intuitively, the statistics show that the variables are fairly spread around the mean an indication that there is no clustering with 6826 as the total number of observations. On average, households having access to MFI accounts, savings and credits are 10 percent, 8 percent and 1.2 percent respectively. While households averagely accessing the informal savings and credits are 25 percent and 13 percent respectively. This is an indication that most households turn to trust informal FI in Cameroon. Averagely, 14 percent of households belong to an ethnic association percent. Female households account for more than 50 percent and the average household size is 5 members. This sample equally presents 67 percent of households working in exchange for pay and about 55 percent of the respondents are from the rural areas of Cameroon. On average, 30 minutes is needed for a household member to reach the nearest MFI infrastructure and about 49 percent of the sample have at least a secondary and tertiary education level. 52 percent of the household in this sample are engaged in a monogamous or polygamous or a free union relationship and about 38 percent of the households earned above the minimum monthly income (36,270 FCFA) in Cameroon(ILO 2014). For more enhance comprehension on the interactions of the overall variables used, look the matrix of correlations in **Table A8** of the appendix.

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4.2. Regression results

4.2.1. Probit regression results

Table 1.2 reports the probit regression results of individual characteristics including the interest variable EBSC on three formal FI indicators (Account ownership, micro savings and microcredits). Model (1), (2) and (3) include the probit coefficients estimates while the respective marginal effects are represented in the columns (4), (5) and (6). The results presented in Table 1.3 include probit regression results of individual characteristics including the interest variable EBSC on two informal FI indicators[1] (Informal Savings and informal microcredits). Model (1), and (2) include the probit coefficients estimates while models (3) and (4) present the respective marginal effects on informal FI. The account ownership is not considered in Table 1.3 since it is difficult to disentangle it in the informal sphere.

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[1] See Demirguc-kunt et *al.*, (2013)

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Table 1.2: Probit regression results of the formal financial inclusion

VARIABLES	(1) Formal Account Ownership Coefficients	(2) Formal Savings Coefficients	(3) Formal Credits Coefficients	(4) Marginal effects Formal account	(5) Marginal Effects Formal savings	(6) Marginal Effects Formal credits
Ethnicity-based Social Capital	0.2519***	0.2485***	0.1919*	0.0265***	0.0248***	0.0037*
	(0.0629)	(0.0633)	(0.111)	(0.0078)	(0.0073)	(0.002)
Age	0.0287***	0.0199*	0.0066	0.0026***	0.0016*	0.0001
	(0.0104)	(0.0105)	(0.017)	(0.0009)	(0.0008)	(0.0002)
Age squared	-0.0003**	-0.0002	-4.21e-01	-0.00002**	-0.00001	-6.95e-1
	(0.0001)	(0.0001)	(0.0001)	(0.00001)	(0.00001)	(0.000)
Gender (female)	-0.1786***	-0.1187**	-0.0936	-0.0162***	-0.0101**	-0.0015
	(0.0512)	(0.0521)	(0.096)	(0.0047)	(0.0045)	(0.001)
Household size	-0.0429***	-0.0517***	-0.0041	-0.0038***	-0.0044***	-0.00006
	(0.0102)	(0.0105)	(0.017)	(0.0009)	(0.0008)	(0.0002)
Employment	0.5145***	0.449***	0.3917***	0.0406***	0.0339***	0.0056***
	(0.0737)	(0.0734)	(0.142)	(0.0051)	(0.0048)	(0.001)
Areas of Residence	-0.0176	-0.1088*	0.0603	-0.0015	-0.0093*	0.0009
	(0.0551)	(0.0565)	(0.103)	(0.0049)	(0.0049)	(0.001)
Distance to MFI (in Minute)	1.2267***	1.1665***	0.8122***	0.1746***	0.1556***	0.0224***
	(0.0539)	(0.0552)	(0.108)	(0.0098)	(0.0094)	(0.003)
Education Level	0.4091***	0.2930***	0.1156	0.0374***	0.0252***	0.0019

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	(1)	(2)	(3)	(4)	(5)	(6)
Marital Status	0.1753***	0.2018***	0.0946	0.0157***	0.0171***	0.0015
	(0.0589)	(0.0607)	(0.105)	(0.0057)	(0.0053)	(0.001)
	(0.0552)	(0.0563)	(0.104)	(0.0049)	(0.0048)	(0.001)
Income Level	0.1416***	0.1785***	-0.0089	0.0131***	0.0158***	-0.0001
	(0.0532)	(0.0548)	(0.097)	(0.0052)	(0.005)	(0.001)
Constant	-3.1545***	-2.8682***	-3.3685***	-	-	-
	(0.2044)	(0.2073)	(0.350)	-	-	-
Y(predict)	-	-	-	0.0422	0.0394	0.0057
Observations	6,825	6,825	6,825	6,825	6,825	6,825
pseudo-R:	0.2646	0.2468	0.1279	-	-	-
log-likelihood:	-1577	-1509	-383.5	-	-	-
Wald Chi-squared	881	791.6	112.4	-	-	-
Prob Wald:	0	0	0	-	-	-

*Note: ***, **, and * entails significant at 1 percent, 5 percent and 10 percent, respectively. Robust standard errors in parenthesis.*

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On the one hand, probit results in models (1), (2) and (3) of Table 1.2 reveal that EBSC, age, employment, distance to the nearest MFI, level of education and marital status of households are positively and significantly correlated to the formal FI indicators. The income levels variable positively and significantly correlated to formal account ownership and micro savings while negatively and insignificantly correlated to microcredit. This can be due to the fact that households are more inclined to deal with other paramount formal financial institutions (Commercial banks) as their income increases. Also, being a female, households' size and being in the rural areas are negatively related to the formal FI indicators. On the other hand, probit results in models (1) and (2) of Table 1.3 reveal that EBSC, age, gender, employment, level of education, marital status and monthly income level of households are positively and significantly correlated to the informal FI indicators. Areas of residence and household size are negatively correlated with to informal FI indicators.

However, the parameter (coefficients) estimates of the probit model only provide the correlation direction between the independent variables and the dependent variables. The marginal effects in models (4), (5) and (6) of Table 1.2 and in models (3) and (4) of Table 1.3 show the infinitesimal change in the probability of formal account ownership, formal savings, formal microcredit, informal savings and informal credits access for a unit increase in the exogenous variables.

In terms of significant marginal effect results, individuals belonging to ethnic group associations are more likely to own a formal account, possess savings and access to microcredit. This ethnic social capital increases the likelihood of the household to own an account in a MFI by 2.7 percent, to save in a MFI by 2.5 percent and ac-

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cess to microcredit by 0.4 percent as presented in Table 1.2. This is consistent with the findings of Fafchamps (2000) and Biggs et *al.* (2002). Accordingly, EBSC also increases the probability to informally save and borrow from an informal provider by 24.9 percent and 12.1 percent respectively in models (3) and (4) of Table 1.3. The weak correlation of EBSC with the formal FI can therefore be explained by the fact that, social capital effects are generally tilted toward informal financial inclusion (Mayoux, 2001; Mwangi and Ouma, 2012; Chai et *al.*, 2018). This is because social capital usually resorts to regular membership saving contributions to lend members in need, cover themselves from unforeseen circumstances. Moreover, social capital or associations based on ethnic ties are well known in Cameroon with its periodic savings mobilisation thus acting a positive determinant of informal savings (Mayoux, 2001).

The results also reveal that as the age of a household increases by a year, the probability to access a formal account and hold micro-savings increase by 0.26 percent and 0.16 percent respectively. The age variable also increases the likelihood of informal savings and informal credits by 1.9 percent and 1.2 percent respectively. But these marginal effects of age changes over time since the respective age squared is negatively correlated to FI indicators. Furthermore, only the gender coefficients estimate and marginal effects significantly alternate signs in both the FI strands. Being a woman is found to decrease the probability of formal account ownership and micro-savings by 1.6 percent and 1 percent respectively. Whereas, women have 7.6 percent and 1.9 percent higher probabilities of accessing informal savings and credits respectively compared to men. This means that men are more inclined toward the formal FI while women are toward the informal FI. This is may be due to the fact that, women in the developing countries gen-

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erally have difficulties to meet up with the requirements of the formal financial institution such as collateral (land, house etc.) thus pulling them toward the informal financial means (Demirguc-Kunt et *al.,* 2013).

In terms of household size, it is found that an increase in the size of the household by a member significantly reduces the likelihood to access accounts and savings both by 0.4 percent. It equally reduces the probability to participate in the informal savings and borrowing by 0.9 percent and 0.2 percent respectively. This is because, an additional member of a household tends to dent any financial resource that could be used for some financial services such as savings (Epo, 2012; Mwangi and Ouma, 2012; Metseyem, 2020). It is also evident from the results that households carrying out a work in exchange for pay or profit is positively and significantly related to both formal and informal FI indicators. So having an employment ameliorates the probability of a formal MFI account ownership by 4.1 percent, savings by 3.1 percent and credit access probability by 0.6 percent. This particular variable also increases the probability of household's access to informal savings and informal credits by 15.9 percent and 5.7 percent respectively.

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Table 1.3: Probit regression results of the informal financial inclusion

VARIABLES	(1) Informal Savings Coefficients	(2) Informal Credits Coefficients	(3) Marginal effects Informal Savings	(4) Marginal effects Informal Credits
Ethnicity-based Social Capital	0.7123***	0.5120***	0.2487***	0.1214***
	(0.0472)	(0.0508)	(0.0179)	(0.0143)
Age	0.0627***	0.0613***	0.0189***	0.0118***
	(0.0062)	(0.0074)	(0.0019)	(0.0014)
Age squared	-0.0006***	-0.0006***	-0.0002***	-0.0001***
	(0.0001)	(0.00001)	(0.00002)	(0.00002)
Gender (female)	0.2505***	0.0987**	0.0756***	0.0189**
	(0.0366)	(0.042)	(0.0109)	(0.008)
Household size	-0.0283***	-0.0118*	-0.0086***	-0.0023*
	(0.0062)	(0.0066)	(0.0019)	(0.0013)
Employment	0.5731***	0.3131***	0.1599***	0.0566***
	(0.0447)	(0.0531)	(0.0113)	(0.0089)
Areas of Residence	-0.0468	0.0522	-0.0142	0.01
	(0.0386)	(0.0442)	(0.0117)	(0.0085)
Education Level	0.1732***	0.0593	0.0525***	0.0114
	(0.0497)	(0.0459)	(0.012)	(0.0089)
Marital Status	0.0725*	0.1636***	0.0219*	0.0314***
	(0.0383)	(0.0438)	(0.0116)	(0.0084)
Income Level	0.0193	0.0245	0.0059	0.0047

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	(0.037)	(0.0428)	(0.0113)	(0.0083)
Constant	-2.6658***	-2.9275***	-	-
	(0.1289)	(0.1558)	-	-
Y(predict)	-	-	0.2288	0.1138
Observations	6,825	6,825	6,825	6,825
pseudo-R:	0.1193	0.0781	-	-
log-likelihood:	-3436	-2477	-	-
Wald Chi-squared	821.2	374.6	-	-
Prob Wald:	0	0	-	-

Note: ***, **, and * entails significant at 1 percent, 5 percent and 10 percent, respectively. Robust standard errors in parenthesis.

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Education level is a positive and highly statistically significant on households' access for both formal and informal FI indicators. Households having at least a secondary or higher level of education are more likely to access formal MFI account by 3.7 percent and formal savings 2.5 percent compared to those with primary education or no education. Education also increases the probability of informal savings by 5.2 percent. By implications, education increase the efficiency of choice made by individuals and serves to enlighten on the different financial services available as well as creating awareness on the best way to manage the available services and provide information to the lender. Further, education builds human capital resulting into a higher earnings power; therefore, the income serves to increase their repayment capacity. These results are consistent with findings by various scholars (Epo, 2012; Mwangi and Ouma, 2012; Mishra, 2017).

Being in a marriage situation increases the probability of formal account ownership and savings both by 2 percent compared to single or widow households. Also, being married increases the probability of informal savings by 2.2 percent and informal borrowing by 3.1 percent. This can be explained by the fact that higher degree of trust is accorded to the unit of marriage and family (Mwangi and Ouma, 2012). Another significant household's characteristics is the monthly level of income. Households with monthly income greater than the minimum wage in Cameroon have higher probabilities of 1.3 percent and 1.6 percent to access a formal account and to hold formal savings.

In terms of geography, urban dwellers have a higher probability to save in a MFI by 0.9 percent compared to the rural dwellers. This can be due to the fact that urban areas present higher financial institutions penetra-

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tion compared to rural areas in Cameroon. Households living less than 60 minutes or 60 minutes to the nearest MFI infrastructure also have higher probability to access a formal account, savings and microcredits by 17.5 percent, 15.6 percent and 2.2 percent respectively compared to households living above 60 minutes. This can be explained by the fact that the higher the distance to the nearest formal financial institution the higher will be the cost incurred by households to access a formal financial service.

Goodness of fit test is respectively verified with the Pseudo R2 in the overall models of this study. All these portray how fit the data is for the models. The hypothesis that all coefficients are equal to zero can be rejected at the level of 1 percent significance since the Wald chi2 (prob) are all at 0.00 for all models.

4.2.2. The Fairlie Nonlinear Decomposition Results

This section presents the nexus between the zone of residence (rural-urban) and financial inclusion, the nexus between gender and financial inclusion and explores the contribution of ethnic association membership (EBSC) on residence and gender differences on financial inclusion. Before exploring the contribution of EBSC to the differences, this study ascertains the significant differences between rural and urban areas and between male and female in terms of EBSC by the application of chi-square test (see Table A2 in the Appendix). The Fairlie decomposition technique results using pooled coefficients are presented in Table A3 to Table A6 of the appendix. For easy comprehension, in the decomposition columns a positive contribution of a covariate indicates that a particular covariate of households' socio-economic characteristics contributes to widen the rural-

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urban gap or gender gap in financial inclusion. While the negative contribution of a covariate indicates the rural-urban gap or gender gap lessening.

4.2.2.1. The Rural-Urban Gap and Financial Inclusion

Table A3 and Table A4 in the appendix present estimates of probit models and the corresponding Fairlie nonlinear decomposition technique results for the rural-urban gap in formal and informal FI respectively. As reported in Table A3, the positive gaps imply that urban households are 7.64 percent more likely to have a formal account, 7.63 percent more likely to have formal savings and 0.61 percent more likely to have formal credits compared to the rural households. However, the outcomes indicate that the rural-urban differences in all reported socioeconomic variables accounts 97 percent in explaining the rural-urban gap in formal account's ownership, 85 percent in the formal savings strand and roughly 100 percent in the formal credit strand. Though the magnitude contribution of EBSC in all formal FI strands is not significant in explaining the rural-urban formal FI gap, other socioeconomic variables (such as age, employment, household size, DFI, level of education, marital status and income level) significantly contribute in explaining the rural-urban gap. Considering the contribution signs of these socioeconomic variables, employment status and age are found to reduce the gap in account's ownership and savings while household size, DFI, level of education, marital status and income level differences are found to widen the gap in account's ownership, savings and to an extend only DFI in the credit strand.

In Table A4. The positive gap implies that urban households are 3.38 percent more likely to have informal savings compared to their rural counterparts and

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the latter negative gap indicates that rural households are 0.48 percent more likely to have informal credits compared to the urban households. The outcomes in both decomposition columns in Table A4 indicate that the rural-urban differences in all the socioeconomic variables account 26 percent in explaining the rural-urban gap in the informal savings strand and 45 percent in the informal credit strand. Contrary to the formal FI strand, the magnitude contribution of EBSC differences in both informal FI strands is significant and other socioeconomic variables (such as employment, household size, level of education, gender (female) and marital status) differences also significantly contribute in explaining the rural-urban gap.

Differences in ethnic association membership (EBSC) explains 45 percent of the rural-urban gap in informal saving strand and roughly a hundred percent in the informal credit strand. This implies that differences in EBSC widen the rural-urban gap in both informal saving and credit strands though in the opposite directions. This can be due to the fact that rural areas in Cameroon are more characterised by a homogenous population (similar ethnic group) which favours the convergence and the formation of a social capital to influence the distribution of resources (specially to access small scale credits) compared to urban areas. Also, households in rural areas are poorer and are mostly engaged in small-scale agriculture and livestock farming activities while urban households are mostly engaged in higher income activities, day to day economic activities and are mostly in the working-class age. This thus favours higher informal saving rates in urban areas compared to the rural areas. Other contribution signs of socioeconomic variables' differences are; employment status, gender (female) and marital status are found to lessen the gap in the informal savings and credit while

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household size and level of education differences are found to widen the rural-urban gap in the informal savings.

4.2.2.2. The Gender Gap and Financial Inclusion

Table A5 and Table A6 in the appendix present estimates of probit models and the corresponding Fairlie nonlinear decomposition technique results for the gender gap in formal and informal FI respectively. In Table A5, positive gaps indicate that male households are 4.82 percent more likely to have a formal account, 3.69 percent more likely to have formal savings and 0.5 percent more likely to have formal credits compared to their female counterparts. Moreover, outcomes also indicate that the gender differences in all reported socioeconomic variables accounts for 58 percent in explaining the gender gap in formal account's ownership strand, 68 percent in the formal savings strand and 60 percent in the formal credit strand. The difference in EBSC contribution in all the formal FI strands is significant, other socioeconomic variables (such as employment, household size, DFI, level of education and marital status) also significantly contribute in explaining the gender gap. These imply that the differences in EBSC by gender explain 1 percent of the gender gap in formal account's ownership, 2 percent in the formal saving strand and -10 percent in the formal credit strand. This implies that differences in EBSC widen the gender gap in both formal account's ownership and formal saving strands and reduces the gender gap in the formal credit stands. Other socioeconomic variables' differences (such as employment status, household size, DFI, level of education and marital status) are found to widen the gap in a formal account's ownership, savings and to an extend only DFI in the credit strand. This is consistent with findings of (Ndoya and Tsala, 2021).

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The evidence in Table A6 indicates that the negative gaps imply that female households are 2.6 percent more likely to have informal savings and 0.16 percent more likely to have informal credits compared to their male counterpart. The outcomes in both decomposition columns in Table A6 also show that the sex differences in all the socioeconomic variables roughly account for a hundred percent in explaining the gender gap in both informal saving strand and informal credit strand. The magnitude contribution of EBSC differences in both informal FI strands is significant and other socioeconomic variables (such as age, employment, household size and marital status) differences also significantly contribute in explaining the gender gap. Differences in ethnic association membership (EBSC) explains 30 percent of the gender gap in informal saving strand and roughly explains a hundred percent in the informal credit strand. This implies that differences in EBSC widen the gender gap in both informal saving and credit stands. Other contribution signs of socioeconomic variables' differences are; employment status, household size and marital status are found to widen the gender gap in the informal savings and households' age is found to reduce the gap in both informal saving and credit strands.

The overall result in this subsection is of threefold. Firstly, there is a gender gap in the formal FI which indicates that male households more likely to have access to formal financial services compared to their female counterparts. Secondly, there is a gender gap in the informal FI indicating that female households more likely to have access to informal financial services compared to their male counterparts. Lastly, differences in gender ethnic association membership significantly contribute in explaining the gender gap in both formal and informal FI in Cameroon. One of the reasons behind

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these results is, since the formal financial strand requires collateral and higher transaction costs to access credits and savings, females may have fewer assets and be less engage in economic activities to sustain the transaction cost compared to their male counterparts. Thus, female households may likely rely on EBSC for informal financial services in Cameroon.

This study equally runs bivariate probit regression models to check the stability of the results using the overall observations. This model provides more robust results in the presence of sample selection bias compared to the precedent univariate probit models. We define the dependent variables in this case as a household's response of being currently saving or borrowing (indebted) and the probability of the household precisely saving or indebted from a formal institution (MFI) or in an informal provider given that these decisions are correlated. Table A7 in the appendix reports the bivariate probit marginal effect results for formal credits, formal savings, informal credits and informal savings. Globally, these results are largely consistent with the results from the univariate probit model results reported on Table 1.2 and Table 1.3. However, after controlling for possible sample selection bias and considering the correlation between the error terms of the two equations some of the nuanced results of the bivariate probit marginal effects necessarily change. For instance, the magnitude of the ESC marginal effects has slightly changed with respect to the informal FI indicators.

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5.   CONCLUSION

The primary objective of this study is to empirically examine the financial inclusion gap between formal and informal beneficiaries in Cameroon using the 2017 Finscope consumer survey. Specifically, the paper (a) measures the marginal effect of ethnicity-based social capital on financial inclusion and (b) assesses the relative contribution of ethnicity-based social capital in explaining the components of the financial inclusion gaps between formal and informal beneficiaries. To achieve these objectives, a bivariate Probit model and Fairlie decomposition technique were used.

The empirical results show ethnicity-based social capital positively and significantly correlates to the probability of accessing formal and informal financial inclusion in Cameroon. But this positive correlation is more pronounced with the probabilities to access informal strands compared to the formal strand. This implies that households belonging to an ethnic group association in Cameroon are more inclined to save and borrow from an informal financial service provider as compared to the formal financial service provider. Moreover, decomposition results show that rural households are significantly less likely to have a formal account, formal savings, formal credits and informal savings but more likely to access informal credits compared to the urban counterparts. The contribution of EBSC significantly broadens the rural-urban gap only in the informal financial strands. The decomposition results equally show that there is a gender gap in all formal FI indicators in favour of male while there is also a gender gap in all informal FI indicators in favour of women. The differences in gender ethnic association membership contribute in explaining the gender gap in both formal and informal FI in Cameroon

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These findings provide rich policy implications. Firstly, this study thus suggests that the nurturing and maintenance of traditional culture, kinship, and identity recognition (characteristics of ethnicity) are still pertinent in the development of financial inclusion in Cameroon. Secondly, financial institutions' marketers can capitalize on these findings, by identifying and designing appropriate operations and strategies, leading to increased customer satisfaction and competitive advantage. Thirdly, formal financial institutions should increase branches in areas with diverse ethnic associations especially in rural areas which has as effects formal account creation and micro savings with high possibilities of obtaining microcredits. This will help to solve difficulties related to financial service allocation such as asymmetry of information, moral hazard, a reduced risk of default and to an extent reduce financial inclusion gender disparities.

This work prompts the presentation of potential directions for further research. Future research should explore the influence of EBSC on the behavioural perspective and enlarge the financial inclusion dimensions not only on the MFI angle as a full formal financial institution like this study so as to have a more enhance magnitude effects of EBSC on financial inclusion.

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Appendix

***Table A1:** Variable measurement and definition*

Variable	Name	Definition
Formal Financial Account	Dependent	Possess an account or join account at a microfinance institution captured as a dummy and it is constructed as follows: 1= MFI account ownership and 0 = otherwise
Formal Savings	Dependent	Still on savings, investment and set aside money in a microfinance institution captured as a dummy and it as constructed as follows: 1= Micro Savings in a MFI and 0 = otherwise
Formal Credit	Dependent	Micro loan from a microfinance institution captured as a dummy and it is constructed as follows: 1= currently indebted or indebted during the last 6 months in a MFI and 0 = otherwise
Informal Savings	Dependent	Still on savings, investment and set aside money in an informal savings group (njangi or tontine) captured as a dummy and it as constructed as follows: 1=

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		Micro Savings and 0 = otherwise
Informal Credit	Dependent	Micro loan from an informal savings group (njangi or tontine) or an informal money lender captured as a dummy and it is constructed as follows: 1= currently indebted or indebted during the last 6 months in an informal provider and 0 = otherwise
Currently Saving	Dependent	Household currently saving or putting away money captured as a dummy: yes=1 and no=0
Currently Borrowing or indebted	Dependent	Household that borrowed money during the last 12 months captured as a dummy: yes=1 and no=0
Ethnicity Based Social Capital (ESC)	Independent	Dummy (1= belongs to a Tribal/ethnic regional and village associations, 0 otherwise)
Age	Independent	*The age of the adult (15+years) individual or household head in years*
Age²	Independent	The age squared of the adult(15+years) individual
Gender	Independent	Dummy (1= Female, 0 otherwise)
Household Size	Independent	Total number of people living in the household
Employment	Independent	Households having a Job or carrying out a work in exchange for pay or profit captured as a dummy (1= has a job, 0 otherwise)
Area of Residence	Independent	Dummy (1= Rural, 0 otherwise)
Distance to MFI (in Minutes) (DFI)	Independent	Minutes to take going from households' home to the nearest MFI Infrastructure captured as

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			a Dummy (1= less than 60 minutes, 0 otherwise)
Education level	Independent		The highest education attainment of the household captured as a dummy (1 = secondary education or higher) and 0 = primary education or lower.
Marital Status	Independent		dummy (1= married, 0 otherwise)
Income Level	Independent		Total personal monthly income of households captured as a dummy (1=greater than the Cameroon's minimum monthly wage (36270 XAF) and 0 otherwise

***Source**: author's computation from the Finscope consumer survey Cameroon 2017 dataset.*

Table A2: *Chi-Square Test of Association between area of residence and EBSC and between Gender and EBSC*

	Ethnic assoc. Membership (EBSC)				
Residence	0	1	Total	Pearson chi2(1)	Asymp. Sig.
urban	2,557	542	3,099		
rural	3,333	394	3,727	68.4413	0.000
Total	5,890	936	6,826		
	Ethnic assoc. Membership (EBSC)				
Gender	0	1	Total	Pearson chi2(1)	Asymp. Sig.
male	2,804	517	3,321		
female	3,086	419	3,505	18.8160	0.000
Total	5,890	936	6,826		

***Source**: Finscope consumer survey Cameroon 2017 dataset.*
***Note**: Binary dependent variables (ESC) taking the value 1, indicating "yes" and taking the value 0, indicating "no".*

Table A3: Fairlie Non-Linear Decomposition of Rural-Urban Gap in Formal Financial Inclusion						
	(1)		(2)		(3)	
Variables	Probit Results Formal account	Decomposition	Probit Results Formal Savings	Decomposition	Probit Results Formal credits	Decomposition
Ethnicity-Based Social Capital (EBSC)	0.0781	0.001	0.1247	0.00147	0.0488	0.0002
	(0.0818)	(0.0012)	(0.0811)	(0.0009)	(0.1487)	(0.0006)
Age	0.0496***	**-0.0989** -129.45%	0.0294	-0.0488	-0.0041	0.0009
	(0.0157)	(0.0446)	(0.0163)	(0.0420)	(0.0264)	(0.0036)
Age Squared	-0.0006***	**0.0970****	-0.0003	0.0482	0.0002	-0.008
	(0.0002)	(0.0443)	(0.0002)	(0.0424)	(0.0003)	(0.0069)
Gender (Female)	-0.0342	-1.61e-05	0.0003	-4.54e-07	-0.0842	2.46e-05
	(0.0673)	(7.60e-05)	(0.067)	(0.0001)	(0.1296)	(7.95e-05)
Household Size	-0.0299**	**0.0012** 1.57%**	-0.0349***	**0.0012** 1.57%**	0.0172	-0.0004
	(0.0132)	(0.0005)	(0.0131)	(0.00042 5)	(0.0213)	(0.0005)
Employment	0.5496***	**-0.0128*** -16.75%**	0.4877***	**-0.0098*** -12.84%**	0.4757***	-0.0016
	(0.0932)	(0.0019)	(0.0912)	(0.00166)	(0.1708)	(0.001)
Distance to MFI (in Minute)	1.2969***	**0.0715*** 93.59%**	1.1749***	**0.0603*** 79.03%**	1.06***	**0.0149*** 248.33%**
	(0.0768)	(0.0044)	(0.0752)	(0.00416)	(0.2007)	(0.004)
Education Level	0.3089***	**0.0124*** 16.23%**	0.1795***	**0.0068** 8.91%**	0.1122	0.0007
	(0.0779)	(0.0032)	(0.0781)	(0.00298)	(0.1485)	(0.001)
Marital Status	0.165**	0.0006	0.2096***	**0.0008* 1.05%**	0.0893	0.0002
	(0.0734)	(0.0004)	(0.0713)	(0.0004)	(0.1454)	(0.000

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						4)
Income Level	0.1039	0.0023	0.1949	**0.0053*** **6.95%**	-0.0569	-0.0001
	(0.0692)	(0.0016)	(0.0702)	(0.0019)	(0.1364)	(0.0003)
Group (Urban)	-	0.1368	-	0.1278	-	0.0152
Group (Rural)	-	0.0603	-	0.0515	-	0.0091
Difference (Gap)	-	**0.0764**	-	**0.0763**	-	**0.0061**
Unexplained Gap	-	0.0021 **2.75%**	-	0.011 **14.42%**	-	0.0007 **11.48%**
Total explained	-	0.0743 **97.25%**	-	0.0653 **85.58%**	-	0.0068 **111.48%**
constant	-3.5294***	-	-3.0348***	-	-3.5462***	-
Observations	3099	6,825	3099	6,825	3099	6,825
pseudo-R2:	0.2352		0.2077		0.1447	
Wald chi2(10)	412.70		349.24		58.94	
Prob > chi2	0		0		0	
Notes : Standard errors in parentheses, the values in percentages represent the contribution or share to gap in respect to total gap, *** p<0.01, ** p<0.05, * p<0.1.						

Table A4: *Fairlie Non-Linear Decomposition of Rural-Urban Gap in Informal Financial Inclusion*

Variables	(1)		(2)	
	Probit Results Informal Savings	Decomposition	Probit Results Informal Credits	Decomposition
Ethnicity-based Social Capital (EBSC)	0.6927***	**0.0154***** **45.56%**	0.4789***	**0.0069***** **143.75%**
	(0.0636)	**(0.0016)**	(0.0697)	(0.0012)
Age	0.0626***	-0.116***	0.0714***	-0.138***
	(0.0103)	(0.0121)	(0.0125)	(0.0171)
Age Squared	-0.0006***	0.106***	-0.0007***	0.133***
	(0.0001)	(0.0133)	(0.0001)	(0.0177)
Gender (Female)	0.3192***	**-0.0029***** **8.58%**	0.0355	-0.0003
	(0.0536)	(0.0007)	(0.0625)	(0.0005)
Household Size	-0.0205**	**0.0042**** **12.43%**	-0.0089	0.0012
	(0.0096)	(0.0019)	(0.0101)	(0.0012)
Employment	0.5322***	**-0.004***** **11.83%**	0.3142***	**-0.0013**** **27.08%**
	(0.063)	(0.0007)	(0.0785)	(0.0005)
Education Level	0.1127**	**0.0121**** **35.79%**	0.0234	0.0016

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	(1)	(2)	(3)	(4)
Marital Status	0.1078*	-0.0026*	0.1487**	-0.0016***
	(0.0576)	(0.0061)	(0.0689)	(0.0048)
		7.69%		33.33%
Income Level	-0.0712	-0.0036	-0.0217	0.0008
	(0.056)	(0.0013)	(0.0647)	(0.0007)
	(0.0535)	(0.0027)	(0.0636)	(0.0024)
Group (Urban)	-	0.2772	-	0.1313
Group (Rural)	-	0.2434	-	0.1361
Difference (Gap)	-	0.0338	-	-0.0048
Unexplained Gap	-	0.0247	-	0.0026
		73.08%		54.17%
Total explained	-	0.0091	-	0.0022
		26.92%		45.83%
constant	-2.6169***	-	-3.0756***	-
Observations	3099	6,825	3099	6,825
pseudo-R2:	0.1182		0.0893	
Wald chi2(9)	385.96		191.11	
Prob > chi2	0		0	

Standard errors in parentheses, the values in percentages represent the contribution or share to gap in respect to total gap, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

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Table A5*: Fairlie Non-Linear Decomposition of Gender Gap in Formal Financial Inclusion*

Variables	(1) Probit Results Formal account	Decomposition	(2) Probit Results Formal Savings	Decomposition	(3) Probit Results Formal credits	Decomposition
Ethnicity-based Social Capital (EBSC)	0.3033***	**0.0009*** 1.87%**	0.3313***	**0.0008*** 2.17%**	0.4330**	**-0.0005* -10%**
	(0.0799)	(0.0003)	(0.0801)	(0.0003)	(0.1314)	(0.0003)
Age	0.0198	-0.0154	0.0151	-0.0094	0.0193	-0.0065
	(0.0129)	(0.0177)	(0.0132)	(0.0146)	(0.0222)	(0.0145)
Age Squared	-0.0001	0.0126	-0.0001	0.0070	-0.0001	0.0057
	(0.0001)	(0.0175)	(0.0001)	(0.0144)	(0.0002)	(0.0142)
Household Size	-0.0439***	**0.0024*** 4.98%**	-0.0646***	**0.0031*** 8.4%**	-0.0269	0.0004
	(0.0137)	(0.0007)	(0.0139)	(0.0008)	(0.0237)	(0.0004)
Employment	0.6287***	**0.0038*** 7.88%**	0.4521***	**0.004*** 10.84%**	0.4932**	0.0002
	(0.1101)	(0.0007)	(0.1096)	(0.0009)	(0.2177)	(0.0003)
Area of Residence	0.0999	-0.0014	-0.0236	0.0003	0.1006	-0.0005
	(0.0725)	(0.001)	(0.0746)	(0.0009)	(0.1357)	(0.0006)
Distance to MFI (in Minute)	1.2451***	**0.0147*** 30.2%**	1.12**	**0.0116*** 31.44%**	0.7381***	**0.0037*** 74%**
	(0.0719)	(0.0014)	(0.0735)	(0.0014)	(0.1381)	(0.0012)

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Education Level	0.3174***	**0.0074*** 15.35%**	0.1847**	**0.0033** 8.94%**	0.1059	0.0005
	(0.0754)	(0.0019)	(0.0790)	(0.0015)	(0.1435)	(0.0006)
Marital Status	0.1859**	**0.0023** 4.77%**	0.2048**	**0.0025** 6.78%**	0.0706	0.0002
	(0.0787)	(0.001)	(0.0823)	(0.0010)	(0.1269)	(0.0004)
Income Level	0.0532	0.00107	0.0899	0.0019	-0.1281	-0.0003
	(0.0697)	(0.0014)	(0.0711)	(0.0015)	(0.1295)	(0.0003)
Group (Male)	-	0.1198	-	0.1051	-	0.0145
Group (Female)	-	0.0716	-	0.0682	-	0.0094
Difference (Gap)	-	**0.0482**	-	**0.0369**	-	**0.005**
Unexplained Gap	-	0.02 41.49%	-	0.0118 31.98%	-	0.002 40%
Total explained	-	0.0282 58.51%	-	0.0251 68.02%	-	0.003 60%
constant	-3.0914***	-	-2.6728***	-	-3.5706***	-
Observations	3321	6,825	3321	6,825	3321	6,825
pseudo-R2:	0.2375		0.213		0.1303	
Wald chi2(10)	446.03		371.98		53.42	
Prob > chi2	0		0		0	

Standard errors in parentheses, the values in percentages represent the contribution or share to gap in respect to total gap, *** p<0.01, ** p<0.05, * p<0.1.

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Table A7: Marginal Effect result of the Bivariate probit regression (Overall dataset)

VARIABLES	(1) Marginal Effects Formal credits	(2) Marginal Effects Formal savings	(3) Marginal effects Informal Credits	(4) Marginal effects Informal Savings
Ethnicity-based Social Capital	0.004*	0.0249***	0.1***	0.2062***
	(0.0023)	(0.0059)	(0.0115)	(0.0159)
Age	0.0002	0.0018***	0.0093***	0.0163***
	(0.0002)	(0.0006)	(0.0011)	(0.0015)
Age squared	-1.04e-06	-0.00002**	-0.00009***	-0.0002***
	(0.00008)	(0.00001)	(0.00001)	(0.00002)
Gender (female)	-0.0017	-0.007**	0.0076	0.0572***
	(0.0013)	(0.0033)	(0.0062)	(0.0088)
Household size	-0.0001	-0.0034***	-0.0018*	-0.0077***
	(0.0002)	(0.0006)	(0.0009)	(0.0015)
Employment	0.0049***	0.0304***	0.0484***	0.1518***
	(0.0531)	(0.0034)	(0.0066)	(0.0087)
Areas of Residence	0.0009	-0.0084**	0.0043	-0.0207**
	(0.0013)	(0.0036)	(0.0065)	(0.0094)
Distance to MFI (in Minute)	0.0172***	0.1147***	-	-
	(0.0031)	(0.0077)		
Education Level	0.0017	0.0205***	0.0158**	0.0523***
	(0.0015)	(0.0039)	(0.0068)	(0.0097)

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Marital status	0.0014	0.0013***	0.0287***	0.0238***
	(0.0014)	(0.0034)	(0.0064)	(0.0092)
Income Level	-0.0001	0.0144***	-0.0011	0.0216**
	(0.0014)	(0.0038)	(0.0063)	(0.0093)
Rho	0.5913***	0.3292***	0.9811***	0.7475***
	(0.0704)	(0.0363)	(0.0331)	(0.0268)
y(predict)	0.0051	0.0298	0.0932	0.1893
Observations	6,825	6,825	6,825	6,825
log-likelihood:	-4182.7	-5657.8	-5739.2	-7202.1
Wald chi2(22)	411.19	1607.6	543.2	1412.5
chi2(1)	70.5	82.2	877.4	777.5
Prob > chi2	0.0000	0.0000	0.0000	0.0000
Wald test of rho	0	0	0	0

Note: ***, **, and * entails significant at 1%, 5% and 10%, respectively. Robust standard errors in pa-renthesis

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Table A8: Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Formal Account	1.000																	
(2) Formal Savings	0.773	1.000																
(3) Formal Credit	0.278	0.280	1.000															
(4) Informal Savings	0.078	0.069	0.025	1.000														
(5) Informal Credit	0.040	0.046	0.024	0.335	1.000													
(6) Currently Saving	0.233	0.212	0.073	0.432	0.171	1.000												
(7) Currently Indebted	0.097	0.099	0.141	0.203	0.472	0.145	1.000											
(8) Ethnic Social Capital	0.131	0.127	0.051	0.245	0.170	0.154	0.127	1.000										
(9) Age	0.029	0.031	0.029	0.135	0.107	0.031	0.022	0.100	1.000									
(10) Age Squared	0.004	0.009	0.022	0.091	0.074	-0.016	-0.008	0.071	0.977	1.000								
(11) Gender (female)	0.082	0.066	-0.023	0.030	0.002	0.057	0.061	0.052	0.022	0.027	1.000							
(12) Household Size	0.081	0.084	0.014	0.074	0.020	0.094	0.019	0.022	0.133	0.130	0.115	1.000						
(13) Employment	0.143	0.130	0.051	0.226	0.138	0.289	0.149	0.116	0.182	0.098	0.177	-0.099	1.000					
(14) Area of Residence	0.130	0.135	0.028	0.038	-0.007	0.097	0.012	0.100	0.129	0.137	-0.017	0.111	0.061	1.000				
(15) Distance to MFI	0.364	0.343	0.117	0.121	0.074	0.172	0.086	0.124	-0.019	-0.035	0.031	0.076	0.052	0.281	1.000			
(16) Education Level	0.147	0.125	0.027	0.018	-0.016	0.084	0.048	0.053	0.341	0.328	0.115	0.084	0.098	0.349	0.223	1.000		
(17) Marital Status	0.049	0.048	0.021	0.091	0.103	0.086	0.092	0.099	0.142	0.069	0.004	0.168	0.175	0.107	-0.033	-0.166	1.000	
(18) Income Level	0.132	0.131	0.028	0.096	0.063	0.184	0.047	0.144	0.058	0.012	-0.123	-0.073	0.199	-0.167	0.124	0.094	0.092	1.000

Source: Computed by authors, Finscope consumer survey Cameroon 2017 dataset.

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