Contribution of ICTs to the performance of MFIs in Cameroon

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Abstract

The objective of this article is to assess the contribution of Information and Communication Technologies (ICTs) to improving the performance of Cameroonian MFIs. To achieve this, data was collected from 88 MFIs through a survey by the use of questionnaires. Main Component Analysis, correlation testing and the Ordinary Least Squares (OLS) method were used. The results obtained show that, in terms of ICT, the use of several computers, an internet connection and an intranet within the company can enhance the MFI's social performance. Furthermore, then the existence of a website does not favour financial performance, with the overall performance, it is rather an asset in the same way as the intranet. These results highlight the need to strengthen access to the commercial internet.

Keywords: MICT • IMF • Financial performance • Social performance

Introduction

Based on a microfinance vision that emphasizes market failure in the sense of [1], microfinance institutions (MFIs) are seen as substitutes for the traditional banking sector [2] and therefore the techniques are often described as "innovative". Thanks to its alternative economic system, the MFI focuses on clients considered risky by the banks because of the transformation costs and information asymmetries perceived by the banks as being quite significant. To this end, it is possible to observe that these institutions are increasingly resorting to E-finance, which takes into account the evolution of technology. Digital has indeed burst onto the financial services market. Initially focused on payments, technological innovation is now winning credit and approaching the land of microfinance institutions (MFIs). The survey conducted by the Microfinance Information exchange (MIX) in 2017 globally found that 61% of MFIs were already deploying alternative distribution channels to reach clients, including the use of automated teller machine (ATMs), telephone payment services (Mobile Banking). In particular, 40% of these MFIs were already using mobile banking services, so 20% are in the experimentation phase. Beyond these innovative practices developed by microfinance over the years, [3] point out that most solutions are based on labour-intensive business models and therefore the aim is to adapt quickly to meet demand. Today, with globalization and the development of information and communication technologies (ICTs), MFIs have now broadened their scope of action while improving their proximity to their clients. However, the implementation and deployment of these technical solutions within microfinance institutions is time-consuming and costly. Furthermore, also seen as a tool for poverty reduction (a common goal with microfinance), ICTs represent a range of services, applications and technologies, using different types of computer hardware and software, often operating through communication networks (Rao, 2009). They play a significant role for individuals and businesses [4], as their usefulness has already been demonstrated not only in promoting development and fighting poverty [5,6], but also in the provision of traditional banking services [7]. ICT, like microfinance, is thus potentially a tool for poverty reduction through improved access to education, financial services, and many others [8]. In developing economies, these two sectors share a common challenge of improving people's living conditions and promoting economic and social development. On this basis, there is therefore a growing concern about how ICTs can be linked with microfinance to increase the chances of achieving sustainable development goals [9]. As in all socio-economic areas of development, there is intense debate about the usefulness of ICTs and the value of integrating them into microfinance [7,9,10] in the face of the profitability/social dilemma [11] faced by some microfinance institutions that keep a social mission in mind while pursuing financial goals. The literature on the use of ICTs in microfinance is fairly recent and focuses on the determinants of the adoption of these new technologies, yet the effect of this adoption on the performance of these particular enterprises could be a source of relevant information. Indeed, the analysis of the contribution of ICTs to the performance of MFIs is a very delicate exercise, particularly since the latter has a dual mission, which is both financial and social. By looking simultaneously at the financial and social dimensions of performance, the aim is to determine the influence of ICT use on the performance of MFIs in Cameroon, both in the financial framework and in the pursuit of their social missions, with a view to improving their status as financial intermediaries. The objective of this work is to highlight the impact of ICT adoption on the financial and social performance of microfinance institutions in Cameroon. Following this introduction this article is organized into four additional sections. The second provides a brief overview of the evolution of ICT in Cameroon and presents some empirical results on the adoption of ICT in microfinance. The third section presents the methodology adopted. In the fourth, we comment on the results. The fifth section concludes the paper.

Contextual framework and empirical results

Despite the strong expansion of ICT, its use remains relatively low in Cameroon. Indeed, according to Global Information Technology's report (2008 to 2009 and 2014), the rate of wireless broadband subscriptions in Cameroon is still close to 0% in 2014 and the country's network penetration index has remained virtually stable over this period, rising from 2.8% in 2008 to 2.9% in 2014 [12]. Despite this weakness, the latest census shows a slight evolution. The proportion of households with telephones (fixed and/or mobile) has increased over time, rising from 30.24% in 2005 to 89.4% in 2017. But it is clear that this proportion is higher in urban areas and especially in the two major metropolises of Douala and Yaounde. Moreover, the same is true for the proportion of households with a computer. Similarly, the survey conducted by the Ministry of Posts and Telecommunications assisted by the National Institute of Statistics (NIS) in 2017, reveals that

Cameroon has made progress in terms of digital technology. Indeed, it emerges from this report that between 2014 and 2017, the ICT development index has evolved by nearly 90%, the index of ICT use in Cameroon was multiplied by 9 and access to ICT has increased by 39.1%. They conclude in their report that "during the three months preceding the survey, about 47% of individuals have used the Internet ..". We can therefore finally say that in terms of ICTs Cameroon has experienced significant progress.

Microfinance in Cameroon: statistical evolution

Despite its important contribution to the development of the national economy and the reduction of poverty levels, the microfinance sector in Cameroon faces many difficulties (risks), the most important of which is the closure of some MFIs. The best known and most publicized cases are: the Goldy Businessmen Fund (GBF) in 2008; the Compagnie Financière de l'Estuaire (COFINEST) in 2011; the First Investment For Financial Assistance (FIFFA) in 2012. And the problems recently encountered by the Compagnie Equatoriale pour l'Epargne et la Crédit d'Investissement (COMECI), affected in 2016 by a cash crisis, revealing the financial fragility of these local financial institutions in Cameroon. Beyond the latter, other reasons have been put forward to justify these failures, including: the existence of over- indebted clients, practices of high overall effective costs, erosion of the confidence of the sector's clients who have seen their savings disappear without any guarantee of repayment. Graph 1 below shows the evolution of the number of MFIs in Cameroon. It shows the drop in the number of these enterprises between 2000 and 2017 (from 652 enterprises in 2000, there will be only 412 in 2017, i.e. a drop of nearly 36.8%). In addition to this aspect, which takes into account the number of MFIs in Cameroon, special attention should also be paid to their geographical distribution. Indeed, the microfinance industry in Cameroon is one of the most heterogeneous and dynamic in the sub-Saharan zone. It benefits from a particular context, marked by a local economy with a strong potential for innovative and very dynamic microenterprises. Another peculiarity of microfinance in Cameroon is that it is based on a long existing tradition of micro-financing. This sector of activity has successively evolved to reach its modern form regulated by Regulation N°01/02/CEMAC/UMAC/COBAC adopted on 13 April 2002 by the Central African Monetary Union, reviewed and amended by Regulation N°01/17/CEMAC/UMAC/COBAC of 27 September 2017, relating to the conditions for the exercise and control of microfinance activity in CEMAC. It nevertheless reveals problems of financial and social performance, efficiency and viability of the sector. This problem is manifested by an imbalance in the supply of services. Table 1 below presents the spatial distribution of the supply of MFI services in Cameroon), by high service costs and by the low level of banking facilities among the population.

Some empirical results on the contribution of ICT in microfinance

The consideration of ICTs in microfinance is recent and work assessing their impact on MFI development and poverty reduction is almost non-existent (Kauffman and Riggins, 2012). Much of the theoretical and empirical research that has examined the issue has focused on prospective analyses of the issues and determinants of ICT adoption in businesses.

In this regard, [11] empirically analysed the determinants of ICT adoption in the Senegalese microfinance industry, including 93 MFIs. They show that ICT adoption is a function of the characteristics of the MFIs on the one hand, and on the other hand that investment in ICT significantly increases the probability that the MFI will perform well. [13] analyzes the determinants of ICT adoption in the 1008 enterprises in Cameroon. He finds that, in addition to the traditional determinants cited by the technology diffusion model and expected profitability, organizational practices are also the rationale for ICT adoption in firms. In addition to these results, the author notes that the nationality and education level of the manager are the factors responsible for ICT adoption. This work is mainly concerned with firms, but the special case of MFIs has been the subject of some work. To this end, [7] truly lay the groundwork for thinking about the role and impact of ICTs on the structures of the microfinance industry. They conduct an analysis of the role and impact of ICTs at several levels (client level, institutional level, donor level and the microfinance industry level), with ideas that highlight the impacts and transformations in the value chain, which provide a basis for assessing the extent to which ICTs support the sustainability of microfinance. Their results show that in a competitive environment, MFIs need to take ownership of this tool that can guarantee their performance and, above all, their survival. Other work has looked at the potential impact of ICTs on the supply and demand of microfinance services, particularly with regard to the effect of ICT integration on the supply side of microfinance on the one hand and, on the other hand, its implications on the well-being of beneficiaries in terms of reduced time, savings in transaction costs, improved income, access to more convenient services (Sall and Birba,

Evolution of IMFs in cameroon
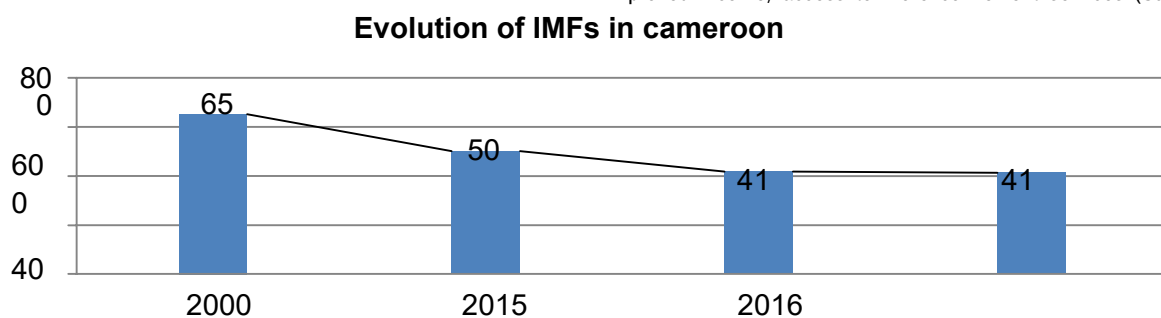
Graph 1: Evolution of the Cameroonian microfinance sector.

Table 1: Spatial distribution of independent and networked institutions in Cameroon.

Region[1]	AD	CE	ES	FN	LT	NO	NW	W	SU	SW	Total	%
Independent establishments	4	63	3	3	54	3	9	35	5	9	188	46%
Network CAMCCUL	5	7	0	11	15	6	59	17	0	45	165	40%
Network CVECA	0	31	0	4	0	5	0	0	0	0	40	10%
Network CMEC	0	0	0	0	0	0	0	19	0	0	19	5%
Total	9	101	3	18	69	14	68	71	5	54	412	100%
%	2%	25%	1%	4%	17%	3%	17%	17%	1%	13%	100%	

Source: Ministry of Finance (2017), authors' calculations based on information published in the daily Cameroon-Tribune

2013).In addition, [10,11,14], address the link between microfinance and ICTs by highlighting macroeconomic effects. At the micro level, the field of research on the impact of ICTs on enterprise development in general, and MFIs in particular, remains fundamentally unexplored. [7] point to the need for in-depth analyses of the impact of ICTs at the level of clients, MFIs and NGOs. [10] attempted to empirically analyze the adoption and impact of ICT in microfinance. They qualitatively studied the cases of 14 MFIs in 8 countries, mostly Latin American. Using the "Pattern Matching" approach, the authors mapped the different types of ICT adopted by MFIs and the different changes in operations and outreach. They show that the adoption of ICTs allows MFIs to increase their reach and provide financial services to the poorest and most geographically remote. [10] also conclude that software and databases (the software) enable MFIs to improve their financial performance, while it is the infrastructure, hardware and telephones (the hardware) that have an impact on the geographical reach of microfinance and the quality of its proximity to clients. Other authors have focused on the role that ICT adoption can play in improving MFI services. On this subject, [15] exploring the Indian case regarding the opportunity of ICTs for the rural world, support with some examples of success, particularly in microfinance, that the use of ICTs allows to reduce transaction costs, reduce risks and improve transparency in the management of these structures. [15] believe that the adoption of ICTs by MFIs not only contributes to reducing their digital divide, but also enables them to operate more efficiently and effectively. For them, ICTs improve staff productivity, quality of service and increase the volume of the institution's activity, thus leading to the realization of economies of scale. Singh (2004) examined the potential channels through which ICTs positively affect the financial services offered by MFIs through the reduction of transaction costs. The work of [16,17] also concludes that ICTs improve the performance of MFIs. According to [18], the use of ICTs in microfinance can increase outreach. Mignone and Henley (2009) believe that MFIs, by introducing ICTs into their relationship with populations, can have significant effects on the social capital of the latter. Another very recent stream of literature on the subject of ICTs concerns mobile banking, the main financial innovation around which academic work has proliferated in recent years. A recent body of work has focused on the study of mobile banking in developing economies [19-23] and generally shows that the advent and adoption of ICTs by MFIs allows them to be more efficient and better developed.

Methodological Approach

This section is organized around three axes. The first presents the sample and the method of data collection. The second deals with the econometric model and the operationalization of the variables. The third deals with the statistical tools for data analysis.

Sampling and data collection

The study covers all the microfinance institutions licensed to operate on the Cameroonian territory and listed by the Ministry of Finance. For the year 2017, 412 MFIs operating in three categories are listed (1st category: savings/credit only with members; 2nd category: savings/credit with shareholders and with third parties; 3rd category: credit without savings collection with third parties). In the absence of a pre-established sampling frame, the sampling method by suitability was adopted. The data are from primary sources and collected from MFIs using a questionnaire that meets the objectives of the study and administered face-to-face to the managers of each MFI surveyed. The survey was conducted in the cities of Yaoundé, Douala and Bafoussam for the simple reason that these cities are not only the largest metropolises, but are also home to most of the MFIs registered in Cameroon. The survey took place over a six-month period (May to December 2018). At the end of this investigation, 120 questionnaires were administered with a return of 96 completed questionnaires (a response rate of 80%) which can be considered satisfactory given the current socio-political context. In view of the requirements of the study, data were filtered

in order to obtain a useful sample for analysis. On this basis, a sample of 88 microfinance institutions from all categories was selected for further analysis. This sample is composed of 45.5% of MFIs with legal status SA, 53.4% of cooperatives/mutuals and only 1.1% with NGO status. The sample is also dominated by MFIs in the 1st category (60.2%), followed by those in the 2nd category (39.8%). In addition, 67% of the institutions surveyed are independent and 33% operate as a network. 70.5% of these institutions are located in both urban and rural areas at the same time, compared to 23.9% and 5.7% that offer their services only in urban and rural areas respectively. Regarding the profile of the respondents, the statistics reveal that 59.1% hold the position of branch manager in the MFIs surveyed, 25% are loan officers, 10.2% are chief accountants, 3.4% are administrative assistants and 2.3% are deputy general managers. The majority of these respondents are male (60.2%). 15.9% of these respondents are under 30 years old, 35.2% are between 30 and 35 years old, 33% are between 35 and 40 years old, 11.4% are between 40 and 45 years old and only 4.5% are over 45 years old. 25% of the respondents say they have less than 3 years of experience working with the surveyed MFI, while at 22.7% the duration of collaboration with the MFI can be between 3 and 6 years, compared to 52.2% who say they have worked with the MFI for more than 6 years. 94.3% of the respondents have a higher level of education and only 5.7% have a secondary level of education.

Econometric model and operationalization of the study variables

It is a question of verifying whether the factors characterizing ICTs improve or deteriorate the performance of MMEs in Cameroon. To this end, the econometric model of the study is presented below:

$$\Sigma + u$$

With the explanatory variables (the ICT), the constant term, the regression coefficients and u the error term. The complete empirical form of the model is as follows:

$$TELEP + u$$

This model will be estimated by the Ordinary Least Squares method for the simple reason that the dependent variable that captures the performance of MFIs is a quantitative variable (end product of a factor analysis). In addition, this estimation will be made according to several other explanatory variables. The World Bank report (2009) conceptualizes ICTs as hardware, software, networks and media for the collection, storage, processing, transmission and presentation of information in the form of voice, data, text and images. Thus, ICTs cover products that can store, retrieve, manipulate, transmit or receive information in digital form. [24] perceive it as electronic messaging, online chatting, file transfer, information retrieval, e-commerce, online payment, etc. It is these perceptions that have made it possible in this study to operationalize the ICT variable by eight indicators commonly used in the literature to characterize ICT. These are: the number of computers, the number of printers, the number of software, the photocopier, the use of a telephone service, the Internet, the presence of a local network (intranet) and finally the existence of a website. Table 2 below defines and summarizes the model variables and their measures. To study the link between ICT and MFI performance, the latter is measured through two dimensions. These are the financial dimension and its social dimension. These two dimensions are measured by several items. Table 3 below presents the operationalization of the variable to be explained, which is the performance of MFIs. Given the large number of items that capture these two dimensions, factor analysis were used, particularly Principal Component Analysis (PCA). The objective was to reduce the number of items that capture each of these dimensions on the one hand, and on the other hand, all of the two dimensions simultaneously. This analysis made it possible to extract the factors from the set of indicators cited. Multidimensional descriptive analyses (flat sorting, central tendency characteristics, dispersion characteristics and Principal Component Factor Analysis) and explanatory analyses (Pearson Correlation Test and the OLS method) were used to process the data.

Table 2: Definition and operationalization of explanatory variables.

Variables	Measures selected by reference to previous studies
Variables related to ICT characteristics	
NBRE_ORD	This variable was measured through the total number of computers in operation within the MFE.
NBRE_LOG	This variable was measured through the number of accounting software used within the MFE.
NBRE_IMP	This variable was measured through the number of functional printers in the agency.
CON_INTER	dummy variable taking the value of 1 if there is an internet connection within the EMF and 2 otherwise.
SITE_WEB	Nominal variable taking the value of 1 if there is a website and 2 otherwise.
INT_NET	Nominal variable taking the value of 1 if there is a website and 2 otherwise.
PHOTO_COPIE	1 for operational photocopier and 2 otherwise.
UTIL_TELEP	Telephone use: This is a dummy variable whose value is 1 if the company uses the telephone for banking and 2 otherwise.

Table 3: Operationalization of the variable to be explained.

Variables	Dimensions	Indicators
Financial performance		- evolution of delinquency rates in MFI
	Profitability	- change in turnover
		- Judging the evolution of the rate of return on equity within IMF
		- change in the economic rate of return
	Targeting	- targeting the poor pauvres
		- use of one or more tools to improve targeting of the poor.
		- proposal for loans secured solely by "social" guarantees
		- the institution offers consumer/emergency loans l'institution propose des prêts de 0 à 6 mo
Social Performance	Scope Limiting risk	- the institution offers loans from 0 to 6 months
		- the institution offers 6 to 12 month loans
		- the institution conducts market research (and in particular family budget surveys) to improve the quality of services to its clients
		- the institution shall provide for credit rescheduling measures in the event of natural disasters
		- provide a type of insurance that relieves the family of the burden of debt in the event of the borrower's death
		- the institution works with loan officers who can speak the local language and who are familiar with the local culture.

Results and Discussions

Results of the descriptive analyses

Firstly, the characteristics of ICTs are presented, and secondly, the results of the Principal Component Factor Analysis are presented.

Description of factors characterizing ICTs: ICTs are operationalized in this study via eight variables. These are the number of computers, the number of printers, the number of software, the photocopier, the internet connection, the intranet and the use of the telephone service for banking transactions. The data show that on average MFIs use three computers, with the number varying between 2 and 6 computers per institution. Regarding the number of software, MFIs use on average one software, with a minimum of one and a maximum of four (4). Regarding the number of printers, on average there are three per MFI and this number varies between one (1) and four (4). Nearly 93.2% of these MFIs have an Internet connection, 76.1% have a website, 77.3% have an intranet, 80.7% have a photocopier and 63.6% say they use the telephone service for banking transactions. Based on this information, it can be concluded that the ICT culture is much more pronounced in MFIs in Cameroon today. However, the larger the institution, the more likely it is to be present on the web, to have an internet connection within it, to have a local network (intranet) and to have at least one computer at almost every workstation.

Result of the principal component factor analysis: The performance of MFIs is measured in this study along two dimensions. These are the financial dimension and the social dimension, depending on the objectives of these enterprises. Each of these dimensions is measured through several indicators, which justifies the use of factor analysis, mainly Principal Component Analysis, given the quantitative nature of the items used. It will

therefore be a question of presenting the results of the factor analysis of each of the dimensions as well as the results of the combination of the two dimensions to obtain an overall performance of the MFIs (given that MFIs simultaneously pursue both economic and social objectives).

Transformation of the financial performance dimension

Financial performance was measured by four indicators: the evolution of the delinquency rate within MFIs, the evolution of turnover, the evolution of the rate of return on equity and the evolution of economic profitability. A Principal Component Analysis was used to identify aggregate factors that are independent of each other. Reliability analysis, the KMO test and the Bartlett specificity test were used to measure the consistency of the items and the quality of representation. Analyses reveal that the KMO test (0.717) is significant with an index greater than 0.5 and the Barlett test (0.000) shows that the factor construction is significant with an index less than 0.05. A first PCA was performed on the four items, after which one item (change in delinquency rates) with an index below 0.5 was eliminated. This analysis had a total variance of 57.995%. Despite the fact that the KMO test had a value of 0.720 and the Barlett test had a zero probability. After eliminating the item "change in delinquency rates", a second analysis was performed on the other 3 items. The results of this analysis identify a single component called financial performance with an eigenvalue (2.248) greater than 1, which explains 74.946% of the total variance and has a Cronbach's Alpha of 0.832 which is widely acceptable.

Transformation of the social performance dimension

Social performance is measured in this study through nineteen indicators measured through the five- point liker scale. The results of the factor analysis indicate that the KMO test (0.599) is significant with an index above (0.599) the 0.5 limit and the bartlett test is significant with an index

below 0.05. The representation quality table revealed that consumer loans and clients' access to the MFI's accounts are the only non-representative items out of the 19 selected items because they have a representation quality below 0.5. After eliminating these two items, seven components are likely to be retained, accounting for 70.230% of the initial information. In this study, only the first component was selected to characterize social performance, since it retrieves most of the initial information (19.490%), unlike the other components. This component consists of two items. It concerns the targeting of the poor and the targeting of the socially excluded (women, illiterates, etc.). The reliability analysis carried out on the 17 selected indicators shows an acceptable level of internal consistency of 0.689 higher than the limit set by the literature.

Transforming the financial and social dimensions into the overall performance of MFIs

Overall performance was measured through two dimensions. These are the financial dimension and the social dimension. A Principal Component Analysis was used to identify aggregate factors that are independent of each other. Reliability analysis, the KMO test and the Bartlett specificity test were used to measure the consistency of the items and the quality of representation. The results show that the KMO test is significant with an index greater than 0.5 (0.616) and the Bartlett test has a zero probability of being significant with an index below 0.05. A principal component analysis was performed on the 23 items selected to characterize overall performance. The results of this analysis identify eight factors with eigenvalues greater than 1, which account for 66.196% of the initial information. As pointed out by Correia et al. (2009), the most frequently used indices derived from Principal Component Analysis are derived either from the first factor or from the proportional average of all factors. Thus, in line with these authors, the first factor was chosen to measure the overall performance of MFIs. Indeed, this factor recovers the bulk of the initial information (17.002%) compared to the other factors. This factor is made up of the three indicators of the financial dimension. These are the evolution of turnover, the evolution of the rate of return on equity and the evolution of the economic rate of return. The reliability analysis carried out on the three indicators selected shows an acceptable level of internal consistency of 0.832, well above the limit set by the literature.

Result of the explanatory analyses

The results of the Pearson correlation test and parameter estimation by the OLS method are presented.

Influence of ICT characteristics on MFI performance: Pearson Correlation Test: The purpose of the correlation analysis is to examine the bi-variate relationship between the dependent variable and the independent variables in the study and to detect the existence of any multi-collinearity problems between the independent variables. Table 4 in appendix presents

the correlation matrix between the different variables in the study. Given the nature (qualitative and quantitative) of the variables used, this correlation matrix is established according to the Pearson Rho method. Examination of this table highlights, on the one hand, some significant correlations between the different characteristics of ICTs and the performance of MFIs. For example, there is a positive relationship at the 5% threshold between the number of computers and performance when measured across its two dimensions (financial and social). This result suggests that MFI performance increases when MFIs have more than one working computer. This result also reveals that MFIs' financial performance is significantly associated with the 10% threshold with the number of printers. On the other hand, there are also significant correlations between the different explanatory variables (the characteristics of ICT) among them. Although these correlations are significant, no severe problem of multi collinearity between these independent variables is detected as the correlation coefficients are relatively low (below 0.8). Indeed, according to Kennedy (1985), in order to make a statement on a true serious problem of multi-colinearity, the correlation should be of the order of more than 80%.

Estimation of parameters by the OLS method: ICTs play an important role in the development of microfinance. To this end, they are called upon to reconcile the twin objectives of outreach and sustainability. In fact, ICTs can be a catalyst for reconciling these two objectives [7]. In order to deepen the above results, multiple linear regression analyses were necessary. Table 5 below summarizes the results of estimating equation (1) using the ordinary least squares (OLS) method for different proxy factors used for MFI reach and profitability. In order to ensure that the variables used did not face a multicollinearity problem, collinearity and autocorrelation tests were used. The premises of the collinearity test suggest: the closer the tolerances are to 1, the more obvious the absence of collinearity appears. Also, a FIV value less than 10 indicates the absence of collinearity (Chatterjee et al., 2000). According to the table in the appendix, by applying this premise, the absence of any collinearity problem between the variables used in our model can be confirmed. Indeed, all FIVs are well below 10 as recommended by the authors, which is satisfactory. In addition, it is important to specify that there is no autocorrelation problem, since the values of the Durbin-Watson test are close to 2 (see Table 6). Thus, the preconditions for performing the regression by the OLS method are met. The results of estimating the three forms of the model reveal two negative and significant values and one positive (but not significant) value of the constant. Moreover, the FISHER (F) statistics are all significant by only 5% with adjusted R2-adjusted values of 0.107, 0.144 and 0.104 respectively. We therefore conclude that the variables taken into account in our various estimation models to characterize ICTs explain only 10.7% of the financial performance, 14.4% of the social performance and 10.4% of the performance taken as a whole. This result is not surprising inasmuch as technology represents only part of the business environment. Consequently, several other variables internal and external to these companies can impact its performance. The results

Table 4: Correlation matrix between study variables.

	NBRE_ORD	NBRE_LOG	NBRE_IMP	CON_INTER	SITE_WEB	INT_NET	PHOTO_ COPIE
NBRE_ORD	1						
NBRE_LOG	0,064	1					
NBRE_IMP	0,466***	0,142	1				
CON_INTER	-0,153	-0,009	-0,065	1			
SITE_WEB	0,019	-0,019	-0,169	0,166	1		
INT_NET	-0,164	-0,002	-0,236**	0,284***	0,205*	1	
PHOTO_COPIE	-0,419***	-0,101	-0,268**	0,210**	0,266**	0,284***	1
UTIL_TELEP	-0,229**	-0,095	-0,18*	-0,017	-0,035	-0,072	-0,071
Perf financière	0,230**	0,096	0,219*	-0,108	-0,298***	-0,223**	-0,327***
Perf sociale	0,224**	-0,038	-0,008	0,250**	0,178	0,18	-0,038
Perf globale	-0,08	-0,129	-0,205*	0,215*	0,270**	0,266**	0,116

***. The correlation is significant at the 0.01 level (two-way).
**. The correlation is significant at the 0.05 level (two-way).
*. The correlation is significant at the 0.1 level (two-tailed).

Table 5: Summary of the regression results of the different basic models.

Financial Performance		Social Performance	Overall performance of MFIs
NBRE_ORD	0,101 (1,002)	0,343 (3,103)	0,099 (0,878)
NBRE_LOG	0,108 (0,596)	-0,072 (-0,396)	-0,199 (-1,074)
NBRE_IMP	0,063 (0,399)	-0,175 (-1,082)	-0,201 (-1,21)
CON_INTER	0,065 (0,152)	0,875 (2,089)*	0,476 (1,111)
SITE_WEB	-0,532 (-2,081)**	0,322 (1,25)	0,516 (1,958)*
INT_NET	-0,236 (-0,89)	0,491 (1,791)	0,532 (1,897)
PHOTO_COPIE	-0,42 (-1,366)	-0,091(-0,297)	-0,091 (-0,29)
UTIL_TELEP	0,042 (0,19)	0,299 (1,352)	0,242 (1,069)
(Constante)	0,698 (0,744)	-2,894 (-3,051)	-1,633 (-1,683)
R	0,189	0,228	0,192
R-two adjusted	0,107	0,144	0,104
F	2,301**	2,729**	2,194**
Durbin-Watson	2,244	2,190	2,237
N	88	83	83

***, **, * : Significant at the respective thresholds of 1%, 5% and 10%.
The terms in parentheses represent the values of the students (t) test

Table 6: Table of collinearity statistics.

ICT features	Financial performance		Social performance		overall performance	
	Tolérance	VIF	Tolérance	VIF	Tolérance	VIF
(Constante)						
NBRE_ORD	0,618	1,619	0,571	1,752	0,571	1,752
NBRE_LOG	0,965	1,036	0,96	1,042	0,96	1,042
NBRE_IMP	0,711	1,407	0,657	1,521	0,657	1,521
CON_INTER	0,883	1,132	0,877	1,141	0,877	1,141
SITE_WEB	0,854	1,171	0,882	1,134	0,882	1,134
INT_NET	0,823	1,215	0,806	1,24	0,806	1,24
PHOTO_COPIE	0,69	1,45	0,68	1,472	0,68	1,472
UTIL_TELEP	0,889	1,125	0,898	1,113	0,898	1,113

confirm that the number of computers (coefficient=0.343; t=3.103), Internet connection (coefficient=0.875; t=2.089) and use of a local area network (intranet) (coefficient=0.491; t=1.791) have a positive and significant effect (at the 1% threshold; 5% and 10% respectively) on social performance. Therefore, the use of computers, linked together by a local network and connected to the internet, allows for an optimal exchange of information between posts and branches, thus increasing the outreach and proximity of MFIs. This result does not contrast with those of Webert et al (2012) who show that the adoption of ICTs allows MFIs to increase their outreach and provide financial services to the poorest and most geographically remote. The coefficients for ICT characteristics such as the number of printers (coefficient=-0.175; t =-1.082), photocopiers (coefficient=- 0.091; t=- 0.297) and software (coefficient=-0.072; t=- 0.396) are negative but statistically insignificant for all model specifications. This implies that the social performance of MFIs cannot be explained by the use of these tools. Thus, the use of software, printers and photocopiers cannot be significant contributing factors in improving the social outreach and proximity of MFIs to their clients. Furthermore, it can be seen from Table 5 above, that the relationship between website use and MFIs' Financial Performance Factor is statistically significant at the 5% threshold and implies a negative coefficient of -0.532. This result suggests that the MFI's use of a website does not improve its financial performance. This conclusion can be justified, on the one hand, by the high expenses involved in the creation and management of such a communication and advertising tool and, on the other hand, by the penetration rate or level of Internet access which still remains low in Cameroon (the consequence being that many people do not have access to the Internet and therefore cannot access the information presented on the companies' websites). In terms of overall performance, the use of a local network (coefficient=0.532; t=1.897) and a website (coefficient=0.516; t=1.958) are assets, in contrast to the targeting, outreach and profitability of MFIs. Indeed, these variables present positive and weakly significant

coefficients at the 10% threshold. Overall, these results are in line with those of Fall and [11], who conclude that investment in ICT significantly increases the likelihood that MFIs will perform through improved outreach [18] and better management of their loan portfolio [17]. [7] point out that in a competitive environment, MFIs must take ownership of this tool that can guarantee their performance and, above all, their survival.

Conclusion

The objective of this paper was to measure the impact that the use of ICTs can have on the development of microfinance enterprises, including their overall financial and social performance. To achieve this objective a survey was conducted in the cities of Douala, Yaoundé, Dschang and Bafoussam, between May and December 2018, through a questionnaire. At the end of this survey and after processing, a sample of 88 MFIs was selected for the study. A Factor Analysis, specifically Principal Component Analysis, was performed on each of the performance dimensions in order to effectively reduce the number of items used to capture it. At the end of this analysis, only one factor was retained for each performance dimension. In addition, a correlation analysis was carried out, followed by an estimation using the Ordinary Least Squares method, given the quantitative nature of the variable to be explained. The results obtained show that in terms of financial performance, the use of a website is not a positive factor, as is the case with overall performance. On the other hand, social performance increases with the number of computers used and the existence of a website and intranet. These results reveal the need to improve access to the Internet. Thus, MFIs should build the ICT capacity of their employees through, for example, training seminars. They should ensure that every employee has a working computer. On the other hand, the quality of the internet connection should be improved. Future work could focus on the

determinants of ICT adoption in MFIs, a broader geographical study, the effect that performance can have on ICT use in businesses globally and specifically in MFIs.

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