UNIVERSIDAD COMPLUTENSE DE MADRID
FACULTAD DE CIENCIAS ECONÓMICAS Y EMPRESARIALES

TESIS DOCTORAL

Generación de riqueza en el tercer mundo a través de la formación financiera en el entorno de los microcréditos

Wealth generation in the third world through financial education in the microcredit environment

MEMORIA PARA OPTAR AL GRADO DE DOCTOR

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Quotes

"Courage and perseverance have a magical talisman, before which difficulties disappear, and obstacles vanish into air"

John Quincy Adams

"Make everything as simple as possible, but not simpler"

Albert Einstein

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Summary

Wealth generation in the third world through financial education in the microcredit environment

Global poverty and its relationship with financial inclusion and financial education provide the motivation for this research. Although extreme poverty has been declining for nearly 25 years, the World Bank estimates that there are still more than 800 million people that subsist on less than US$1.90 a day. Most of these individuals are unbanked and relay on local informal economies. Financial inclusion has been broadly recognized critical in alleviating poverty and achieving inclusive economic growth. Access to financial services is referred in at least five of the 17 Sustainable Development Goals (SDGs) set by the United Nations 2030 Agenda. Undeniably there is a close relationship between economic development and financial inclusion, however recent research suggests that having an account does not necessarily imply better financial health. Although much economic and financial literature has highlighted the importance of microfinance as a factor in development, there is also an intense debate about its effectiveness as a development tool. Some researchers even suggest that microcredit can have a negative impact on the most vulnerable.

Under these circumstances the second chapter is concerned with a critical evaluation of microfinance institutions (MFI) in Peru with a particular focus on its impact on the final user. The purpose is to identify MFI´s key factors for improving financial inclusion. We have used a qualitative methodology, as this study is explanatory in nature. The research is based on a review of the literature on MFIs and on interviews and discussions with key microfinance players in Peru. We chose Peru because it has a dynamic and well-regulated microfinance sector. The results of the present study confirm that financial and accounting education are key elements in financial inclusion and that extending the basic digital infrastructure to the more vulnerable population offers a great opportunity to provide financial services, including financial education, at much lower cost.

Following the conclusions of our previous research, we decided to address the problem of financial education in the third chapter. In the first part we describe different financial education programs provided by MFI`s and analyse their characteristics and impact on microcredit beneficiaries. In the second part, we carry out a field experiment whose purpose was to analyse the potential effectiveness of a practical accounting case using a cash flow template. We conducted a controlled experiment between groups (intervention and control). Our findings showed that participants performed better in the intervention group, proving that the cash-template helped them record transactions and increased awareness about the importance of the accounting information and the use of digital technologies.

The capability of borrowers to repay their microcredit loans is a very important issue and is the first risk of MFI´s sustainability. In the fourth chapter, using a multivariate regression

model, we identified the factors that could affect the repayment behaviour among micro-credit borrowers from savings groups. We used the data of over 7.000 users of the "Saving and Learning" program promote by Savinco Social Finance (SAVINCO)[1] in Ecuador. SAVINCO is a social enterprise that belongs to Expert Timing Systems (ETS)[2] a Spanish high-tech company specialized in quantitative finance, with the mission to improve socio-economic inclusion of the most vulnerable population in Latin America by promoting community savings groups. Empirical results demonstrated that factors such as seniority, accumulated capital and the number of members in the savings groups are determinant variables of default risk. To contrast and contextualize these results we had in-depth discussions with the SAVINCO managers and their field agent in Ecuador.

In chapter five, we show conclusions and contributions of this dissertation classified for practitioners, academics, and development institutions. For practitioners, we have learned that just having a bank account or access to credit do not imply financial inclusion. Without the necessary financial education, access to banks accounts or credit can have a negative impact on the most vulnerable, such as over indebtedness or repayment problems. The situation of the most vulnerable population is very diverse, and this heterogeneity must be considered when promoting healthy financial behaviours. In addition, MFI should incorporate in their daily activities the use ICT. For academics, we propose promoting cooperation among research centres. For example, jointly designing digital financial education for developing countries. For institutions, we suggest public-private collaboration to develop the necessary ICT infrastructures and provide the necessary framework for increasing stability and integrity of MFIs, and protection of the more vulnerable.

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[1] https://savinco.org/#/
[2] https://www.etsfactory.com/

Resumen

Generación de riqueza en el tercer mundo a través de la formación financiera en el entorno de los microcréditos

La pobreza global y su relación con la inclusión financiera y la educación financiera son la motivación de esta investigación. Aunque la pobreza extrema ha ido disminuyendo durante los últimos 25 años, el Banco Mundial estima que todavía hay más de 800 millones de personas que subsisten con menos de 1,90 dólares al día. La mayoría de estas personas no están bancarizadas y dependen de la economía informal. Es ampliamente reconocido que la inclusión financiera es fundamental para aliviar la pobreza y lograr un crecimiento económico sostenible, como demuestra que el acceso a los servicios financieros está presente en al menos 5 de los 17 Objetivos de Desarrollo Sostenible (ODS) establecidos por la Agenda 2030 de las Naciones Unidas. Aunque gran parte de la literatura económica y financiera ha destacado la importancia de las microfinanzas como factor de desarrollo, también existe un intenso debate sobre su eficacia. Investigaciones recientes apuntan que tener una cuenta bancaria no implica necesariamente una mejor salud financiera e incluso sugieren que puede tener un impacto negativo en los más vulnerables.

En estas circunstancias, en el segundo capítulo se realiza una evaluación crítica de las instituciones microfinancieras en Perú con un enfoque en el impacto en el beneficiario final. El principal objetivo es identificar los factores clave que pueden ayudar a las Instituciones Microfinancieras (IMF) a mejorar la inclusión financiera. Hemos utilizado principalmente una metodología cualitativa, ya que este estudio es de carácter explicativo. La investigación se basa en una revisión de la literatura y en entrevistas y discusiones con actores clave de las microfinanzas en Perú. Elegimos Perú porque tiene un sector micro financiero dinámico y bien regulado. Los resultados del presente estudio confirman que la educación financiera y contable son elementos clave en la inclusión financiera y que la ampliación de la infraestructura digital básica a la población más vulnerable ofrece una gran oportunidad para prestar servicios financieros, incluida la educación financiera, a un coste mucho menor.

Tras las conclusiones de nuestra investigación anterior, decidimos abordar el problema de la educación financiera en el tercer capítulo. En la primera parte describimos diferentes programas de educación financiera impartidos por las Instituciones Microfinancieras y analizamos su impacto en los beneficiarios de microcréditos. En la segunda parte, realizamos un experimento de campo con dos grupos: intervención y control. El objetivo era analizar la eficacia potencial de un programa de formación financiera mediante la resolución de un caso práctico que consistía en contabilizar las transacciones de un microempresario y desarrollar la información de gestión. Al grupo de intervención les facilitamos una plantilla de flujo de caja. Nuestros resultados muestran que los participantes del grupo de intervención obtuvieron mejores resultados, lo que demuestra que la herramienta digital les ayudó a registrar las

transacciones y aumentó la concienciación sobre la importancia de la información contable y el uso de herramientas digitales.

La morosidad es cuestión de gran importancia y constituye el primer riesgo de sostenibilidad de las IMF. En el cuarto capítulo, utilizando un modelo de regresión multivariante, identificamos los factores que podrían afectar al comportamiento de reembolso entre los prestatarios de microcréditos de los grupos de ahorro. Utilizamos datos de más de 7.000 usuarios del programa "Ahorrar y Aprender" promovido por Savinco Social Finance (SAVINCO) en Ecuador. SAVINCO es una Fundación perteneciente a Expert Timing Systems (ETS), empresa española de alta tecnología especializada en finanzas cuantitativas, cuya misión es mejorar la inclusión socioeconómica de la población más vulnerable en América Latina mediante la promoción de grupos de ahorro comunitario. Los resultados empíricos demostraron que factores como la antigüedad, el capital acumulado y el número de miembros de los grupos de ahorro son variables determinantes del riesgo de impago. Para contrastar y contextualizar estos resultados, mantuvimos conversaciones en profundidad con los responsables de SAVINCO y su agente de campo en Ecuador.

Finalmente en el capítulo quinto, mostramos las conclusiones y contribuciones de esta tesis clasificadas para profesionales de micro finanzas, academia e instituciones. Para los profesionales de microfinanzas, resaltar que el mero hecho de tener una cuenta bancaria o acceso al crédito no implica la inclusión financiera. Sin la necesaria educación financiera, el acceso a las cuentas bancarias o al crédito puede tener un impacto negativo en los más vulnerables, como el sobreendeudamiento o los problemas de reembolso. La situación de la población más vulnerable es muy diversa, y esta heterogeneidad debe ser considerada a la hora de promover comportamientos financieros saludables. Además, el uso de las TIC debe incorporarse en mayor medida a las actividades diarias de las IMF. Para los académicos, debemos promover mayor cooperación entre los centros de investigación desarrollando proyectos conjuntos, por ejemplo, contenidos de educación financiera en formato digital para los países en desarrollo. Para las instituciones, sugerimos la colaboración público-privada para desarrollar las infraestructuras TIC necesarias y proporcionar el marco jurídico que garantice la protección de los más vulnerables y la estabilidad e integridad de las instituciones IMFs

I

Introduction

Global poverty and its relationship with financial inclusion and financial education provide the motivation for this research. Although extreme poverty has been declining for nearly 25 years, the World Bank estimates that there are still more than 800 million people, 7.9 per cent of the world population, that subsist on less than US$1.90 a day. Based on the recent evolution, it was expected that extreme poverty could decrease to 6 per cent by 2030, however Covid-19 now threatens to increase extreme poverty in many countries (PovcalNet, 2020). Most of these individuals are unbanked and rely on local informal economies. In addition, the population at the base of the Pyramid (PBP) are among the most affected by COVID lockdowns and health or economic crises. Some authors argue that microcredit could be used to cope with this situation, but increase the risk of indebtedness (Brickell et al., 2020). Reducing poverty has been numbered at the top of the list of the United Nations Sustainable Development Goals (SDG) (United Nations 2030 Agenda), but COVID-19 crisis has placed poverty at the centre of governments' priorities as they tried to reach those who are most affected.

In addition, Banerjee, Duflo and Kremer were awarded the 2019 Nobel Prize in Economics for their work "fighting poverty" (The Royal Swedish Academy for Sciences, 2019). All three were recognized for their "experiment-based approach research" to fight poverty and suggested that problems should be identified by breaking them down into smaller and more precise questions in order to lead to reliable proposals that work. For example, Banerjee and Duflo are well known for their research in the field of education. Using Randomized Control Trials (RCT) methodology they performed field experiments trying to identify which interventions could improve educational outcomes in developing countries at the lowest cost; for example, buying more textbooks or providing free school meals.

The profile of the unbanked usually consists of low net-worth individuals, mainly women, living in rural areas and with little or no collateral (Demirgüc-Kunt et al., 2018). Women's empowerment is an important goal to achieving sustainable development and consequently, offering women access to microfinance services is a good way to improve family living standards. However, empirical evidence provides mixed results with respect to its effectiveness (Huis et al., 2017). Banerjee and Duflo, 2007 wrote in their book, *Poor Economics,* "The poor are no less rational than anyone else-quite the contrary. Precisely because they have so little, we often find them putting much careful thought into their choices. They have to be sophisticated economists just to survive" (page 11).

Financial inclusion has been broadly recognized as critical in alleviating poverty and achieving inclusive economic growth. In fact, access to financial services is present in at least five of the 17 SDGs set by the United Nations 2030 Agenda for Sustainable Growth. Over the past few decades, the debate on the importance of financial inclusion has been intensifying as never before. Several studies show that access to financial products can positively affect households and the economy as a whole. Microcredit could help them build their asset base, support income-generating activities and expand their range of choices (Di Giannatale and Roa, 2019; Leatherman et al., 2011; Armendáriz and Morduch, 2010; Solo, 2008). The

ultimate purpose of providing access to financial services to the unbanked population was to improve the quality of life of the more vulnerable and to promote entrepreneurship as a way out of poverty (Morris, Santos and Nuemeyer, 2019). We believe that there is a close relationship between economic development and financial inclusion in line with Deb and Kubzansky (2012), however recent research suggests that having a bank account, the common measure for financial inclusion, does not necessarily mean better financial health.

Financial inclusion must be measured not only by access to financial products but, more importantly, by their quality and use (Arellano, et al., 2019; Karlan et al., 2017). There are many different aspects to fully achieve sustainable financial inclusion beyond the possession of a financial product, but single solutions are inadequate in confronting the complex problem of poverty (Arellano et al., 2019).

Although much economic and financial literature has highlighted the importance of microfinance as a factor in development, there is also an intense debate about its effectiveness as a real development tool. Morduch (2017, page 1) argues that "Microfinance has proved fairly robust as a banking idea but not as an anti-poverty intervention". Pollin and Feffer (2007, page 1) also concluded "Making credit accessible to poor people is a laudable aim. But as a tool for fighting global poverty, microcredit should be judged by its effectiveness, not good intentions". A variety of studies provide evidence that other factors are even more important in explaining poverty reduction such as social policies based on conditional cash transfer (CCT) (Biderbost and Jiménez, 2016), quality of the institutions, monetary stability or job creation (Acemoglu and Robinson, 2012; Rodrik et al., 2004).

CCT programs started in the late 1990s in Latin America and have become an important resource in many developing countries to reduce extreme poverty. The objective of these programs is to reduce poverty via cash transfers mainly to poor woman. These regular cash transfers are conditional to visits to the doctor for young children or regular school attendance for school-age children. Most CCT programs incorporate education in health, basic finance and other issues. Numerous evaluations of CCTs, many based on experimental designs, find positive short-term impacts (Molina Millán et al., 2019).

The Bill and Melinda Gates Foundation for example, states that good nutrition is one of the most impactful investments in global poverty reduction and poor nutrition is the underlying cause of nearly half of child deaths and children´s physical and mental health, however, only one per cent of donor aid is dedicated to addressing it (Bill and Melinda Gates Foundation, 2020).

The strong links between financial and accounting literacy and the levels of success in managing microcredits have attracted considerable attention from researchers in the field of cooperation programs. For example, authors such as De Mel et al. (2014); Bali and Varghese (2013); Verrest (2013); Berge et al. (2012); Karlan and Valdivia (2011); McIntosh et al. (2011) and Gubhert and Roubaud (2005) have studied the impact of implementing different microfinance programs alongside with compulsory training in business and conclude that

financial education together with microcredit improves financial outcomes. Even in developed economies, the level of financial literacy has a major impact on financial stability.

Moreover, a profound digital revolution is taking place, characterised by unstoppable technological advances (Mazzucato, 2021, Ochoa et al., 2016). Mobile phones and other technological devices have increased exponentially in recent years mainly due to the global investment in the extension of mobile network and the design of low-cost devices (IFC, 2018). This digital revolution not only affects mobile communications and new Information and Communication Technologies (ICT), also affects the microfinance industry.

Ontiveros, Martín Enriquez, and Lopez Sabater (2014) claim that increasing digitization of financial services provides an enormous potential for improving financial inclusion with less expensive financial services models, more accessible and efficient, such as branch-less banking models or mobile payment with simple text-based phones. It is expected that the new use of financial and mobile accounts will have positive and long-term effects on financial inclusion (Global Microscope, 2019). However, the full potential of mobile technologies cannot be reached without the active cooperation of governments and the private sector

COVID -19 pandemic has not only created a health crisis but also a deep economic downturn. In order to reduce the virus transmission, most countries imposed strict lockdowns and the mobility restrictions are affecting Latin American countries more deeply because of the region's structural vulnerabilities. COVID-19 now threatens to increase extreme poverty in many countries and this environment has created an unprecedented challenge for microfinance institutions. MasterCard (2020) for example has reported that approximately 40 million people across Latin American have become banked over the past few months, but this situation presents challenges as well as opportunities

Furthermore, COVID-19 pandemic has forced vulnerable population to embrace new digital technologies. This highlights the need to accelerate investments in innovation and technology globally and to boost capacity and relevant skills. SDG 9 (Industry, Innovation, and Infrastructure) is the goal that reveals the largest gap in infrastructures between developed and developing countries.

We organized our research work as follows: In the first chapter we do a review of the literature about microfinance, financial inclusion and financial education, in the second chapter a critical evaluation of microfinance institutions in Peru is carried out using a qualitative approach. In the third chapter we show tangible results in helping vulnerable people solve a practical problem in the field of financial and accounting education. In the fourth chapter we identify the factors that affect default behaviour among micro-credit borrowers of savings groups using a multivariate regression model. The purpose of this research was to identify the characteristics of group members' that minimize default risk. This dissertation ends with a chapter dedicated to global findings, discussion and conclusions.

Chapter 1

In this first chapter of "State of Art" we perform a review of the literature of the general topics affecting the microfinance industry. First we start with microfinance origins, mission (section 1.1) and its recent evolution (section 1.2), followed by the recent evolution of financial inclusion (section 1.3) and the relationship with financial education (section 1.4). In section five, will briefly cover the topic of information and communication technologies and how these new technologies could affect the microfinance industry. We finish in section 1.6 with the effects of COVID-19 on Microfinance.

Chapter 2

Although much economic and financial literature has highlighted the importance of microfinance as a factor in development, there is also an intense debate about its effectiveness. Some researchers even suggest that microcredit can have a negative impact on the most vulnerable (Blattman and Ralston, 2015; Bateman and Chang, 2009; Karnani, 2007, 2006), or that positive impact is very limited (Cull, et al., 2018; Prahalad and Hammond, 2002). Recent research suggests that the low impact of microcredits on the poor could be due, among other things, to the low level of financial education (De Mel et al., 2014; Karlan and Valdivia, 2011). Citi Foundation (2011) suggests that currently, most micro borrowers do not have the necessary skills to use their loan proceeds properly and many of them just use the microcredit for basic consumption needs.

Given the different academic positions towards the impact of microcredit on the more vulnerable, we suggest objectivity based on evidence. This second chapter is concerned with a critical evaluation of MFI with a particular focus on its impact on the beneficiaries. The purpose of this chapter is to understand the effectiveness of microfinance institutions in alleviating poverty and to identify the key factors for improving financial inclusion. We have used a qualitative methodology, as this study is explanatory in nature. The research is based on a review of the literature on MFIs and on interviews and discussions with key microfinance players in Peru. We chose Peru because it has a dynamic and well-regulated microfinance sector compared with other countries in Latin America. Currently, there are over 70 entities specialised in microfinance with an outstanding loan portfolio of US$ 12.7 billion and more than five million borrowers (Microfinance Barometer 2018).

With this background our first research question was:

RQ 2.1: What do Microfinance actors claim are the key factors for improving financial inclusion?

We carried out 29 in-depth face-to-face interviews with different microfinance agents: MFIs, NPOs, microfinance associations, and microfinance customers in Peru. Face-to-face interviews allowed for more intensive questioning given that the presence of an interviewer makes it possible to cover other areas of interest not included in the original interview agenda and these might also be important for the research (Parker and Tritter, 2006). The

interviewees were carefully selected based on their specific roles in order to allow us to get a full picture of the Peruvian microfinance market. We visited both, MiBanco, which is the largest MFIs in Peru, and Financiera Confianza (FC), well known for its technology. Together they have more than 40 per cent market share of the microfinance market in Peru. Representing the world of NPO, we visited ADRA, a global international organization focused on women savings groups, and "Acción Emprendedora", an interesting NPO focused on financial education. We examined their commercial models, target sectors, products and services, and their potential to accomplish their mission of alleviating poverty. In addition, we interviewed the key MFIs associations in Peru and finally, to understand the sector better, we also visited some microfinance customers in the Lima area.

We concluded that there are many factors that can influence financial inclusion such as access to financial products, level of financial education, use of technology, alternative channels and digital products and services in line with Di Giannatale and Roa (2019).

This chapter contributes to the debate over how to improve the impact of microcredit interventions on the more vulnerable and identifies some unique insights into the interrelationships of financial education and financial inclusion. The results of the study confirm that financial and accounting education are key elements in financial inclusion. The gap in financial education may lead to over indebtedness and repayment problems, thereby increasing the risk of MFI´s sustainability.

Chapter 3

Following the conclusions of chapter 2 and given the difficulties of delivering financial education to the vulnerable population living in rural areas, we decided to implement a field experiment in three universities in Madrid, Spain. The purpose of the experiment was to analyse the potential effectiveness of a practical accounting education program that could be used by micro-entrepreneurs with virtually no knowledge of accounting. Recent research suggests that traditional financial education programs have not been successful in improving financial knowledge, and that the impact improves when tutoring is adapted to the needs of micro-entrepreneurs (IPA, 2018; De Mel et al., 2014; Bali and Varghese, 2013; Verrest, 2013; Berge et al., 2012; Karlan and Valdivia, 2011; McIntosh et al., 2011; Gubhert and Roubaud, 2011).

Hence, the main aim of chapter 3 was to find the answer to the following research questions:

RQ 3.1: How can financial and accounting literacy be boosted in the digital age?

RQ 3.2: Is it possible and useful to improve financial and accounting education by using an accounting ICT tool?

In the first part of the chapter we describe different financial education programs provided by MFIs and analyse their impact on financial inclusion. In the second part, to test

the effectiveness of the accounting tool, we apply a randomized control trial (RCT) method to a sample of University students. The purpose of this method was to test a potential solution to a development problem—such as how to improve financial education —by comparing a group that received a treatment with a control group that received nothing. The groups should be as similar as possible and randomly selected so that no other factors could influence the outcomes.

The sample comprised 233 students from three different universities. The selected students were randomly allocated to the experimental conditions (control and intervention groups) and were tested only once. Both groups were given a case study that described the transactions over three months of a female entrepreneur in rural Peru who had started an in-house business. We asked both groups to record the transactions and develop some management information together with some strategic decisions. The intervention group of students was also given a cash flow excel template, developed by the authors while the control group were just given the case study.

Our findings showed that participants performed better in the intervention group, proving that the cash-template helped them to record transactions and better understand their business. It also raised awareness about the importance of digital tools to improve the level of financial and accounting knowledge.

Chapter 4

It is often maintained that the credit needs of the relatively poor are not met by the commercial banks because of a lack of adequate loan guarantees (Yunus, 2003; Hollis and Sweetman, 1998). The provision of small loans to fight poverty is one of the core objectives of microfinance institutions but the mission of these institutions goes beyond credit. Their main goals are to help micro entrepreneurs in job creation, and self-empowerment. However, efficiency and sustainability of these institutions are important for their survival. (Morris, Santos, and Neumeyer, 2018). Thus, financial viability is important to MFIs in order for them to achieve their mission and a broader range of objectives. The current COVID-19 environment has created an unprecedented challenge for MFIs. In response to the pandemic most MFIs are trying to help their customers by easing loan conditions, postponing repayments, or loan restructuring. The ability of borrowers to repay loans will determine the MFIs ability to survive the pandemic.

This fourth chapter is concerned with over indebtedness and consequently repayment problems in developing countries. The capability of borrowers to repay their microcredit loans is a very important issue and is the primary risk for the sustainability of an MFI. In contrast to commercial banks, MFIs can neither secure loans with collateral nor screen borrowers. A high rate of non-performing loans is one of the main causes of bank failures. Exploring the determinants of credit risk is an issue of substantial importance for financial stability (Reinhart and Rogoff, 2010). Factors affecting loan delinquency in microfinance can be dramatically different from loans in developed countries (Kodongo and Kendi, 2013;

Field, Pande and Papp, 2010). Potential factors determining loan delinquency among microfinance customers have been widely covered in the literature (Beg and Bashir 2017; Baland, et al., 2017; Muthoni, 2016; Field and Pande, 2008; Adongo and Stock, 2005; Churchill, 2004; Norell, 2001 among others). These factors include interest rates, age, loan value, repayment period and loan category (group or individual). In relation to loan category, Kodongo and Kendi (2013) suggest that group-lending programs are more effective than individual lending programs in mitigating the risk of default. Hence this chapter explores the determinants of default risk in savings groups.

The Research Questions we defined for chapter 4 are the following:

RQ 4.1: What are the determinants of savings group members default risk?

RQ 4.2: Does gender influence default on loan repayments?

The purpose of this research was to identify the characteristics of savings group members that minimize default risk. We used both quantitative and qualitative approaches. Quantitative approaches focused on applying statistical methods to numerical data and rigorous interpretations of the results. We applied a multivariate regression model to a sample of 7,251 active users of the "Saving and Learning" program developed by Savinco Social Finance (SAVINCO) in Ecuador. SAVINCO is a social enterprise that belongs to Expert Timing Systems (ETS), a Spanish high-tech company specialized in quantitative finance. Its mission is to improve socio-economic inclusion of the most vulnerable population in Latin America by promoting the use of technology in community savings groups. The data was extracted from the SAVINCO cloud-mobile platform Qmobile App. The purpose of the App was to help group members to monitor group financial transactions, manage their monthly meetings more efficiently and to deliver financial education. The primary intention of quantitative research is to use deductive reasoning (Creswell et al., 2006), but deeper understanding was gained only by exploring the perceptions of the participants. For this we had the invaluable support of SAVINCO field agents in Ecuador to validate our findings.

Most of the participants in the programme were female (68.3 per cent), which is common in this type of informal savings institutions. A multivariate logistic regression model was fitted to the data to identify the factors that affect the non-performing loan behaviour of the members of the "Saving and Learning" program in Ecuador. Our results were contrasted and contextualised with SAVINCO managers through various interviews, discussions and meetings to help gain a deeper understanding of the results and correct the possible biases from unobserved individual situation.

Overall, most of the explanatory variables had expected behaviours. Particularly, gender, seniority, total received amount, average loan, average loan term, group life, and initial members had a positive and significant effect on default. Accumulated savings, group current capital, number of current members, and initial females' percentage have also a significant effect but inverse, meaning the higher value of the variables, the lower the probability of

default. However, neither age, number of loans received, rural area, group initial capital nor current female percentage had any significant effect on default risk.

As a result, our first conclusion is that it is necessary to observe the behaviour of beneficiaries of a loan if they suffer debt recurrence to prevent them becoming over-indebted. As hypothesised, when financial education is provided in the regular repayment meetings, the higher the number of sessions attended the better-prepared borrowers will be to make the appropriate decisions regarding loan size and repayment period.

Savings Groups (SGs) members could tend to become less risk adverse after years of continuous borrowing. We recommend a break period between loans and that before granting a new loan, records of borrowers' financial obligations to other institutions should be required. In relation to the loan size and term, we consider that the important factor is the size of the repayment instalments. They should not be more than 30 per cent of their regular income as SAVINCO managers suggested. Considering group size, groups that are initially too broad could be of concern since joint liability might not work well if members do not know each other well or do not have strong family ties.

Furthermore, the use of technology in SGs should be promoted. Although the main purpose of the SAVINCO platform was to help group members to manage their monthly meetings, the on-line data also allows users and managers to perform continuous follow up and quality control of the program. In addition, an App is a perfect channel to provide financial education to SGs members or microfinance beneficiaries. The challenge is to generate long-term saving habits and management skills that will allow users to improve their financial health and consequently improve their life conditions

Chapter 5

This dissertation concludes with Chapter 5, which summarizes the overall results and conclusions. We can say that the microfinance sector is under great pressure, but the pandemic represents a unique opportunity to accelerate the necessary changes in the sector. The first is to boost investment in digital technologies, as these will play an important role in advancing financial inclusion and consequently the economic recovery of the most vulnerable population. This can only be achieved if governments and the private sector work together to help the unbanked reduce their digital gap by investing first in expanding access to networks and second in financial education. In addition, international organizations should work together to provide the necessary regulatory framework to improve the credibility, stability and integrity of microfinance institutions as well as the protection of the most vulnerable. From the point of view of academia, cooperation between different research centres in the development of digital financial education programs aimed at developing countries could be a good starting point. There is a credible possibility of a new era of innovation that could raise the standard of living of the most vulnerable population.

References

Acemoglu, D. and Robinson, J. (2012). *"Why Nations Fail: The origin of power. Prosperity and Poverty"*. Crown Business. New York.

Adongo, J. and Stock, C. (2005)*. "Factors Influencing the Financial Sustainability of Selected Microfinance Institutions in Namibia"*. Namibian. Economic Policy Research Unit, Windhoek.

Arellano, A. Camara, N. and Mejia, D. (2019). "Disentangling Vulnerability through Consumer Behavior: The Role of Financial Health". *Working Papers 19/11. BBVA Bank, Economic Research Department.*

Armendáriz, B. and Morduch, J. (2010). *"The Economics of Microfinance"*. 2nd ed, MIT Press, Cambridge, MA.

Banerjee, A. and Duflo, E. (2007). "The economic lives of the poor". *Journal of Economic Perspectives, V.21, 141-167.*

Baland, J.M., Gangadharan, L., Maitra, P., and Somanathan (2017). "Repayment and exclusion in a microfinance experiment". *Journal of Economic Behavior and Organization, V.137(C), 176-190.*

Bali, S.R. and Varghese A. (2013). "Delivery mechanisms and impact of microfinance training in Indian self-help groups". *Journal of International Development, V.25, 11-21.*

Bateman, M. and Chang, H. (2009). "The microfinance illusion*". SSRN Electronic Journal, DOI: 10.2139/ssrn.2385174.*

Beg, K., and Bashir, H.A. (2017). "An Empirical Analysis of Factors affecting the Loan Repayment Performance of Microfinance Institutions". *Pacific Business Review International, V.10(2), 144–153.*

Berge, L. I. O., Kjetil, B., Kartika, J. and Bertil, T. (2012). "Business training in Tanzania: From research driven experiment to local implementation*". Journal of African Economies, V.21(5), 808-827.*

Biderbost Moyano, P. and Jiménez J. (2016). "Experiences of impact assessment in development aid in Latin America". *Miscelanea Comillas, V.74(144), 35-63.*

Bill and Melinda Gates Foundation, (2020). *https://www.gatesfoundation.org/.*

Blattman, C. and Ralston, L. (2015). "Generating Employment in Poor and Fragile States: Evidence from Labor Market and Entrepreneurship Programs". *Available at SRRN https://ssrn.com/abstract=2622220.*

Brickell, K., Picchioni, F., Natarajan, N., Guermond, V., Parsons, L., Zanello, G., and Bateman, M. (2020). "Compounding crises of social reproduction: Microfinance, over-indebtedness and the COVID-19 pandemic*". World Development. Elsevier.*

Citi Foundation (2011). https://www.citigroup.com/citi/foundation/..

Creswell, J.W., Shope, R., Plano Clark, V.L. and Green, D.O. (2006)."How Interpretive Qualitative Research Extends Mixed Methods Research". *Research in the school. V.13(1), 1-11.*

Churchill, C.F. (2004). "La microfinance est-elle une priorité pour les pauvres? Comprende la demande de services financiers de gestion des risques". *ADA Dialogue, V.33, 11-30.*

Cull, R., Demirgüc-Kunt, A.,and Morduch J. (2018). "The Microfinance Business model: Enduring Subsidy and Modest Profit". *The World Bank economic Review, V.32(2), 221-224.*

De Mel, S., Mckenzie, D. and Woodruff, C. (2014). "Business training and female enterprise start-up, growth, and dynamics: Experimental evidence from Sri Lanka". *Journal of Development Economics, V.6, 199-210.*

Deb, A. and Kubzansky, M. (2012). *"Bridging the Gap: The Business Case for financial capability".* Citi Foundation and GIIN.

Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J. (2018). "*The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution"*. The World Bank. https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1259-0.

Di Giannatale, S. and Roa, MJ. (2019). "Barriers to formal savings; Micro and Macroeconomic effects". *Journal of Economic Surveys, V.33(2), 541-566.*

Field, E., and Pande, R. (2008). "Repayment frequency and default in microfinance: evidence from India". *Journal of the European Economic Association, V.6, 501–509.*

Field, E., Pande, R., and Papp, J. (2010). *"Does microfinance Repayment Flexibility Affect Entrepreneurial Behavior and Loan Default?".* Microfinance Gateway, 6. https://www.moodys.com/microsites/miic2010/presentationfiles/Field.pdf.

Global Microscope (2019). https://www.centerforfinancialinclusion.org/global-microscope-2020.

GMSA (2020). "The Mobile Economy 2020". https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/03/GSMA_MobileEconomy2020_Global.pdf.

Gubhert, F. and Roubaud, F. (2011). "The Impact of Microfinance Loans on Small Informal Enterprises in Madagascar. A Panel Data Analysis*". World Bank, Washington, DC.*

Hollis, A. and Sweetman, A. (1998) "Microcredit: What can we learn from the past?". *World Development, V.26 (10), 1875-1891.*

Huis, M., Hansen, N., Otten, O. and Lensink, R. (2017). "A Three-Dimensional Model of Women's Empowerment: Implications in the Field of Microfinance and Future Directions". *Frontiers of Philosophy, 8(SEP).*

Innovation for Poverty Action (IPA) (2018) "Beyond the Classroom: Evidence on New Directions in Financial Education. Innovation for Poverty Action". https://www.poverty-action.org/sites/default/files/publications/Beyond-the-Classroom-Financial-Education-Brief.pdf [accessed 25 August 2020].

International Finance Corporation. World Bank Group (IFC) (2018). "Mexico selects winning tender for national wholesale mobile network"
https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/impact-stories/reshaping-telecom-industry-mexico.

Karlan, D. and Valdivia, M. (2011). "Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions". *The Review of Economics and Statistics, V93 (2), 510-527.*

Karlan, D.S., Savonitto, B., Thuysbaert, B., and Udry, C.R. (2017). "Impact of savings groups on the lives of the poor". *Proceedings of the National Academy of Sciences, V.114, 3079-3084.*

Karnani, A. (2006). *"Fortune at the Bottom of the Pyramid"*. WP 1035. Michigan Ross School of Business.

Karnani, A. (2007). "*Employment, not microcredit, is the solution*". WP 1065. Michigan Ross School of Business.

Kodongo, O., and Kendi, L.G. (2013). "Individual lending versus group lending: An evaluation with Kenya's microfinance data". *Review of Development Finance, V.3(2), 99-108.*

Leatherman, S., Metcalfe, M., Geissler, K., and Dunford, C. (2011). "Integrating microfinance and health strategies: examining the evidence to inform policy and practice". *Health Policy and Planning, V.27(2), 85–101.*

Mastercard (2020). "The acceleration of financial inclusion during COVID-19 pandemic. Bringing hidden opportunities to light". https://newsroom.mastercard.com/latin-america/files/2020/10/Mastercard_Financial_Inclusion_during_COVID_whitepaper_EXTERNAL_20201012.pdf.

Mazzucato, M. (2020) "*Mission Economy: A Moonshot Guide to Changing Capitalism*" Amazon. e-book kindle.

McIntosh, C.; Villaran, G. and Wydick, B. (2011). "Microfinance and Home Improvement: Using Retrospective Panel Data to Measure Program Effects on Fundamental Events". *World Development, V.39 (6), 922- 937.*

Microfinance Barometer (2018). http://www.convergences.org/wp-content/uploads/2018/09/BMF_2018_EN_VFINALE.pdf.

Molina Millán, T., Barham, T., Macours, K., Maluccio, J. and Stampini, M. (2019). "Long-Term Impacts of Conditional Cash Transfers: Review of the Evidence ". *The World Bank Research Observer*, V.34 (1), 119–159.

Morduch, J. (2017). *"Microfinance as a credit card"*. Limn, Issue 9, Little development devices/Humanitarian goods.

Morris, M.H., Santos, S.C. and Neumeyer, X. (2018). *"Poverty and entrepreneurship in developed economies"*. Cheltemham, UK: Edward Elgar Publishing.

Muthoni, P. (2016). "Assessing Borrower's and Business. Factors Causing Microcredit Default in Kenya: A Comparative Analysis of Microfinance Institutions and Financial Intermediaries". *Journal of Education and Practice, V.7(12), 97-118.*

Norell, D. (2001). "How to reduce arrears in Microfinance institutions". *Journal of microfinance, V.3, 115-130.*

Ochoa, B., de Salas Lasagabaster, A. and Robredo Núñez, M. (2016). "*El Nuevo modelo de creación de valor de la banca basado en tecnologías disruptivas*". Mindsait – Indra. https://www.minsait.com/es/actualidad/insights/el-nuevo-modelo-de-creacion-de-valor-de-la-banca-basado-en-las-tecnologias.

Ontiveros, E, Martín Enriquez, A and Lopez Sabater, V. (2014). *"Microfinanzas y TIC. Experiencias Innovadoras en Latinoamérica"*. Fundación Telefónica and Analistas Financieros Internacionales (AFI).

Parker, A., and Tritter, J., (2006). "Focus group method and methodology: current practice and recent debate". *International Journal of Research and Method in Education, V.29(1), 23-37.*

PovcalNet (2020). *"Poverty and Shared Prosperity 2020"*. World Bank Development Economics division. http://iresearch.worldbank.*org/PovcalNet/home.aspx*.

Pollin, R. and Feffer, J. (2007). "Microcredit: False Hopes and Real Possibilities. Is microcredit the solution to global poverty? Yes and no*…."*. *Foreign policy in Focus. Retrived from. https://fpif.org/microcredit_false_hopes_and_real_possibilities/*.

Prahalad, C.K., and Hammond. A. (2002). "Serving the world's poor profitably". *Harvard Business Review Sept 02, RO2095.*

Reinhart, C. and Rogoff, K. (2010). "Growth in a Time of Debt*". American Economic Review: Papers and Proceedings, V.100, 573-578.*

Rodrik, D., Subramanian, A., and Trebbi, F. (2004). "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development". *Journal of Economic Growth, V.9(2), 131-165.*

SAVINCO (2021). "Savinco Social Finance". https://savinco.org/#/.

Singularity University (2021). *"Feed the World: How Exponential Tech Can Create an Abundant Future"*. https://f.hubspotusercontent00.net/hubfs/7432255/eBooks/Singularity-University-SU-EB-Feed-the-World-EN.pdf?hstc=15229545.33e748a05ae42ad24ab699e514aa466c.1618047668413.1618047668413.1618047668413.1&__hssc=15229545.2.1618047668413&__hsfp=3466246394.

Solo, T.M. (2008). "Financial exclusion in Latin America or the social cost of non banking the urban poor". *Institutional Environment and Development, V.20,46-66.*

The Royal Swedish Academy for Sciences, (2019). *"Press release: The Prize in Economic Sciences"* 2019. NobelPrize.org. Nobel Media AB 2021. Thu. 21 Jan 2021. https://www.nobelprize.org/prizes/economic-sciences/2019/press-release/.

United Nations (UN). *"2030 Global Agenda"*. http://www.undp.org/content/gcp/en/home/2030agenda/

Verrest, H. (2013.). "Rethinking Micro entrepreneurship and Business Development Programs: Vulnerability and Ambition in Low-income Urban Caribbean Households". *World Development,V.47, 58-70.*

Yunus, M. (2003) *"Banker to the Poor Micro-Lending and the Battle Against World Poverty*". Perseus B Perseus Books LLC.

1

Chapter 1. State of Art

Global poverty, financial inclusion and financial education provide the motivation for this research. Access to financial services is present in at least five of the 17 Sustainable Development Goals (SDGs) set by the United Nations 2030 Agenda for Sustainable Growth. Although in the past few years, the world has seen the most rapid progress towards SDG 1 (No Poverty), the World Bank estimates that there are still more than 800 million people (7.9 per cent of the global population) that subsist on less than US$1.90 a day, of which 75 million are in Latin America. Most of these individuals are unbanked and rely on local informal economies. Based on this evolution, it was expected that this figure could decrease to 6 per cent by 2030, however Covid-19 now threatens to increase extreme poverty in many countries (PovcalNet, 2020). The coronavirus has not only created a sanitary crisis but also a deep economic crisis. The current COVID-19 environment has created an unprecedented challenge for the continuity of microfinance institutions (MFIs), especially small and medium-sized ones, when their financial services are needed more than ever by small businesses. The economic and social effects of the pandemic have significantly impacted women's autonomy and have highlighted the digital gender gap that still exists in Latin America.

In this chapter we do a review of the literature of the following topics. First we start with the microfinance industry (section 1.1) and its recent evolution (section 1.2), followed by financial inclusion (section 1.3) and the relationship with financial education (section 1.4). In section five, will also briefly cover the topic of information and communication technologies and how these new technologies could affect the microfinance industry. We finish in section 1.6 with the effects of COVID-19 on Microfinance.

1.1 Microfinance industry

Financial inclusion has been broadly recognized critical in alleviating poverty and achieving inclusive economic growth (Deb and Kubzansky, 2012). Several studies show that access to financial products ensures people are better able to start or expand new businesses, increase education and improve living standards (Leatherman et al., 2011; Armendáriz and Morduch, 2010). Also access to financial services for both small entrepreneurs and individuals can lift them out of poverty and contribute to the community's economic growth (Solo, 2008).

Microfinance can be defined as a set of activities aimed at providing financial services to the population that has been excluded from the traditional financial system. These activities are not simply banking operations; their main objective is to promote the creation and development of small productive activities and should be conceived as an integral development tool for the more vulnerable population. The most studied instrument within microfinance are microcredits.

The origin of microcredits dates to the 60´s but became more popular in early 80s after Muhammad Yunus, known as the "banker of the poor", foundation of the Grameen Bank in Bangladesh in 1976 (Yunus, 2003). The absence of formal financial institutions in rural

areas drove Yunus, who was granted the Nobel Peace Prize in 2006, to develop the idea of microcredit. In its original vision, the microcredit concept consisted of giving small loans, primarily to female entrepreneurs at the bottom of the pyramid, for productive and survival purposes. These women were unserved by the regular banks because of the lack of collateral or simply because they did not have easy access to banks. The primary purpose was to provide an alternative way of finance to the oppressive regime of traditional moneylenders, which was the only source of credit available to the most vulnerable population. Moneylenders were viewed as exploitative of poor borrowers, often charging usurious interest rates (Mookherjee and Motta, 2016; Pellegrina, 2011). The final purpose of providing access to financial services to the unbanked population was to improve the quality of life of the more vulnerable and to promote entrepreneurship as a way out of poverty (Morris, Santos and Nuemeyer, 2018).

The core of Grameen Bank innovation was "the group". Borrowers at most Microfinance Institutions (MFIs) are organized into groups with joint liability, meaning that if anyone in the group is unable to repay its loan each other member of the group should pay for some portion of the loan obligation. This system promotes close monitoring of individual behavior by the group unlike the banking system and it is based on mutual trust (Karlan, 2007; Ghatak, 2000). Group borrowers tend to be less delinquent than individual borrowers (Mokhtar, Nartea and Gan, 2009). The group-based approach enables poor people to accumulate capital by way of small savings and facilitates their access to informal credit facilities. Microcredit groups usually have weekly or monthly meetings where members repay their loan instalments and serve both as a social occasion and as an opportunity to receive financial literacy training.

Yunus´s second core idea was the focus on women because they are more vulnerable. Worldwide women have been historically disadvantaged in terms of education, social exclusion, discrimination, and access to assets or other resources (Demirgüc-Kunt et al., 2018; Raihan and Uddin, 2018; Fafchamps et al., 2011; Pitt and Khandker, 1998). In addition, women are considered better administrators than men and are more concerned about their families. FMBBVA (2019) stated that supporting women means supporting the following generations. Although women's access to credit has improved in the last few years, there is still a strong gap between women and men (Demirgüc-Kunt et al., 2018). Currently, following the United Nations 2030 Sustainable Development Goals (United Nations, 2015), various policies and support mechanisms are being implemented to elevate the status of women to fulfil international recommendations.

Since Grameen Bank was created, MFIs have expanded rapidly all around the world with the primary mission to alleviate poverty by giving small loans, primarily to female entrepreneurs (Yunus, 2003). According to the Microfinance Barometer 2018, MFIs reached all around the world in 2017, 139 million low-income clients with a loan volume of US$114 billion. Table 1.1 displays microcredit activity by country.

Table 1.1 Top ten countries by number of borrowers and loan portfolio

	Number of beneficiaries (million)	Total credit (US$ billion)
India	50.9	17.1
Peru	5.1	10.8
Vietnam	7.4	7.9
Bangladesh	25.6	7.8
Colombia	2.8	6.3
Cambodia	2.4	8.1
Pakistan	5.7	1.8
Mexico	6.8	4.4
Brazil	3.5	2.6
Philippines	5.8	1.3

Source: Author's own compilation, from Microfinances Barometer 2018

Latin American countries comprise half the list in terms of volume of credit. Peru, with a total volume of US$10.8 billion, ranks first in Latin America and second after India. India and Bangladesh are top of the list in terms of the number of beneficiaries.

Lately MFIs have undergone a huge transformation, offering a wider range of financial products and services and many of them have become formal/regulated institutions (Gutierrez-Nieto and Serrano-Cinca, 2019; Giné and Karlan, 2014; Van Rooyen, Stewart and de Wet, 2012; Hermes and Lensink, 2011). Microfinance Institutions can be classified in three different groups: deposit-taking institutions like commercial banks, credit-only non-deposit taking institutions and informal organizations. The latter category includes savings groups (SGs), club pools and financial services associations and this is the area where we are going to concentrate our research (Kodongo and Kendi, 2013; Kirkpatrick and Maimbo, 2002).

1.2 Microfinance recent evolution

Although much economic and financial literature has highlighted the importance of microfinance as a factor in development, there is an intense debate about its effectiveness as a development tool (Maity, 2019; Ditcher, 2007). Some researchers even suggest that microcredits may have a negative impact on the most vulnerable (Cull, Demirgüc-Kunt and Morduch, 2018; Cull and Morduch, 2018; Bateman and Chang, 2009; Vogelgesang, 2003; Prahalad and Hammond, 2002) being over-indebtedness and lack of financial education some of the main problems (Bali and Varghese, 2013; Berge et al., 2012). Authors like Gutiérrez-Nieto and Serrano-Cinca (2019) believe microfinance is a robust banking idea but not an anti-poverty intervention on its own. Pollin and Feffer (2007) suggested that credit

accessible to poor people is a laudable aim, however as a tool against global poverty, microcredit should be judged by its effectiveness.

In recent years the efficiency, scope and effectiveness of microfinance have been questioned (Hudon et al., 2019, 2018; Hermes and Hudon, 2018; Gutierrez-Goiria et al., 2017; Mader, 2017; Banerjee, et al., 2015; Daley-Harris, 2009; Ditcher, 2007; Cohen, 2003). Theory and evidence have revealed concerns about the real impact of microcredits on the alleviation or reduction of poverty (Cull, Demirgüc-Kunt and Morduch, 2018). There are concerns that the microcredit market may be saturated and that intense competition between MFIs may be pushing customers into over-indebtedness (Risal, 2018; Schicks, 2014, 2013; Angelucci et al., 2013; Hulme, 1997)). MFI applying aggressive lending practices to extend the borrower base, is causing "over indebtedness" and "loan overlapping" (Haldar and Stiglitz, 2016). In addition, some microcredits research experts pointed out the MFIs high interest rates, high transaction costs and the risk of over-indebtedness (Hermes and Hudon, 2018; Morduch, 2017; 2016; Roodman and Morduch, 2014; Angelucci et al., 2013; Hudon and Ashta, 2013; Hudon and Sandberg, 2013; Kappel et al., 2010). In addition, a new generation of more rigorous impact research studies using randomised control trials have found no evidence that microcredits increase household income, but only that microfinance is helping the beneficiaries to deal with their circumstances (Banerjee et al., 2015; Tarozzi et al., 2015; Crèpon et al., 2011). The literature review of Cull et al. (2018) shows only modest average impact on microcredits customers or zero impact on the poverty of clients (Roodman, 2012). In addition, Duvendack et al. (2011) performed a meta-study, revising 74 papers, and found that almost all of them used weak methodologies, inadequate data, or lack of rigor. On the other hand, supporters of microcredit argue that it helps to improve qualitative factors such as the empowerment of women (Shivaprasad, 2020), access to education, and improvement of other social aspects that transcends the immediate surroundings of the lenders (Simanowitz and Walther, 2002).

Gutierrez-Nieto and Serrano-Cinca (2019) reviewed 1874 papers published from 1997 to 2017 to perform a scientometric analysis of the microfinance field. The study identified the evolution of the trend topics in microfinance research: the most recent ones are financial inclusion, social entrepreneurship and Islamic microfinance. The classic topics remain, such as mission drift, as well as long-standing ones such as efficiency, outreach and sustainability.

In the last few years, scandals like "Compartamos" IPO in 2007 and Andhra Pradesh in 2010 are producing a microfinance industry crisis. India´s state Andhra Pradesh ceased all collections on microcredits after 30 suicides caused by the pressure to repay their loans (Mader, 2013). Banco Compartamos, one of Latin America's leading banking institutions has been seen as a successful example of a microfinance institution going public but Compartamos offering has raised serious concerns in view of the huge profits it produced for shareholders in the IPO. They argue that the aid money that was granted to Compartamos in its early years has been used to enrich private investors. The balance

between social and commercial objectives is raising debate on ethical issues regarding making profits from the Bottom of the Pyramid (Ashta and Hudon, 2012).

Given that donors and governments want to ensure the social return of development aids, the investment in impact assessment in development programmes is no longer a marginal issue and has become a strategy itself. Between 2013 and 2016, investment in impact assessments of development aid programmes grew by 385 per cent: in 2016, it was US$22.1 billion (Global Impact Investing Network (GIN, 2018).

Financial inclusion is a complex field and unrealistic expectations might lead to misaligned priorities and disappointments. Decision-makers should clarify their positions on financial inclusion, regarding the benefits they expect it to bring to whom and how (Mader, 2017).

In the case of microfinance, donors must judge whether providing the poor with access to financial services yields a sufficient social return compared to alternative poverty alleviation efforts.

1.3 Financial Inclusion

Account ownership is one of the most common indicators for establishing the level of financial inclusion. In 2011, the World Bank (WB) launched a Global Findex database that covers more than 140 economies. Although real progress has been made in expanding financial inclusion, between 2011 and 2017 the number of people worldwide with a bank account grew by 1.2 billion (see Figure 1.1), there are still 1.7 billion adults (31 per cent of the global adult population), most of them in developing economies, that remain unbanked (Demirgüç-Kunt et al., 2018).

Figure 1.1 Evolution of account ownership (2011-2017). Adults with an account (%)
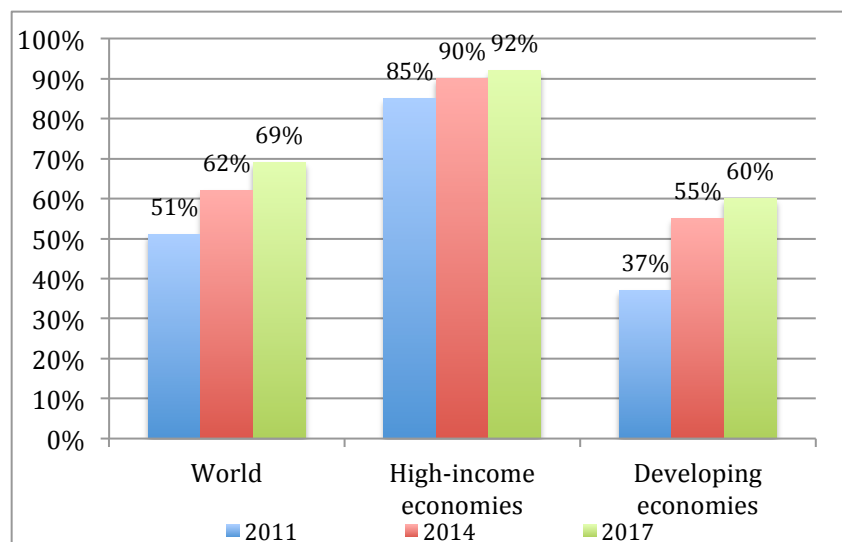
Source: Authors 'own compilation using Global Findex database 2017

Not surprisingly, the unbanked population in all the countries show similar characteristics: lower income and lower education than the population at large; they are young, 30 per cent of adults with no account are aged 15 to 24, 62 per cent have little or no education and 47 per cent are unemployed. Additionally, most unbanked adults are women, as seen in Figure 1.2.

Figure 1.2 Unbanked populations ranked by level of education,

gender and employment status(%)
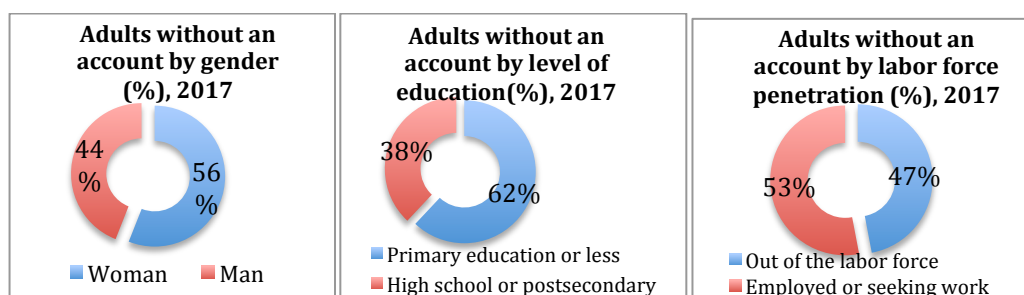
Source: Authors 'own compilation using Global Findex database 2017

Other important results of the Global Findex 2017 are the most common reasons for not having an account. The principal one is the lack of money; 66 per cent of adults without an account identified this as the primary reason, and 20 per cent said it was the only reason. Other reasons include (in order of diminishing importance): no necessity for an account; accounts are too expensive; financial institutions are located too far away; lack of enough credit information; lack of trust in financial institutions and religious reasons (Mookherjee and Motta, 2016; Giné and Karlan, 2014; Karlan, Ratan and Zinman, 2014). In other occasions the problem is that they are excluded by other members of the group (Marr, 2004; Hulme and Mosley, 1996). However, there is also the case that although they are creditworthy, micro-entrepreneurs have no interest in borrowing from formal institutions because they do not understand or trust the banking system (Ciravegna, 2006), or they do not have a "savings culture" (Adusei, 2013; Van Rooyen, Stewart and de Wet, 2012; Ashraf, Karlan and Yin, 2006; Duflo et al., 2006; Benartzi and Thaler, 2004). In addition, the rural poor use of their bank accounts is very limited due to financial illiteracy and several other problems (Sen and De, 2018).

In recent years more people have gained access to financial services. A remarkable case is India, where adults with accounts increased to 80 per cent in 2017, thanks to the cooperation between government and private institutions. India's biometric identity schemes, and government benefit programmes paid through accounts, had helped to increase financial inclusion. In the same period, in Africa 232 million accounts were added. Concretely, in Kenya, mobile financial services are offered by mobile network operators, and mobile money accounts do not need to be linked to an account at a financial institution.

This has helped to increase account ownership to 72 per cent of adults in just a few years (Raman, 2018).

Regarding borrowing money, most borrowers in high-income economies rely on formal financial institutions, while in developing economies is only an 18 per cent. They tend to borrow money from family or friends (see Figure 1.3) and use other sources of informal lending (Demirgüc-Kunt et al., 2018).

Figure 1.3 Adults borrowing money in 2017 (%)
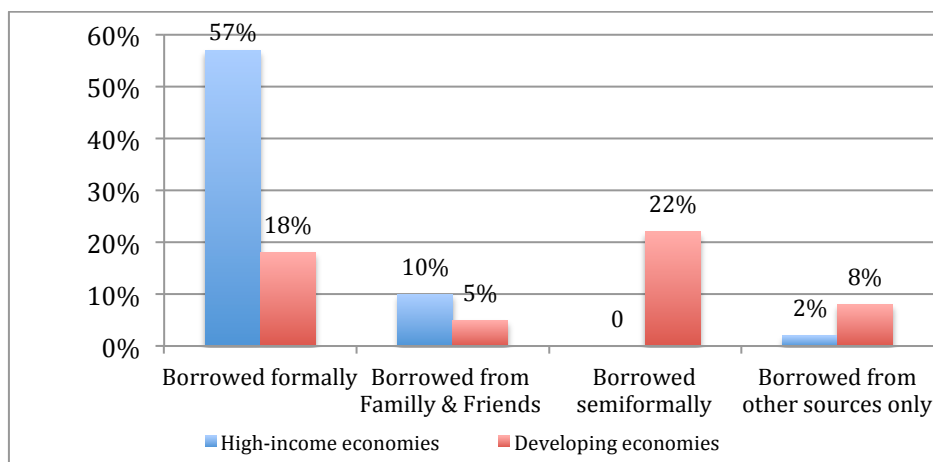
Source: Authors 'own compilation using Global Findex database 2017

Nevertheless, the number of poor entrepreneurs who access microcredits remains low (Ammar and Ahmed, 2016; Bateman and Chang, 2009; Banerjee and Duflo, 2007; Simanowitz and Walther, 2002). There is still a large population who are financially excluded for several reasons: they may not have access to MFIs, or are not creditworthy (Hulme and Mosley, 1996); they are excluded from group-lending projects by other group member or the requirements for granting the loan cannot be met, or the minimum amounts are too high (Kirkpatrick and Maimbo, 2002; Mosley, 2001). Also, many creditworthy micro-entrepreneurs have no interest in microcredit financing because they fear the sanctions for non-payment. These people are the most risk-averse, and they do not understand the concept of borrowing nor do they have a savings culture (Urquía-Grande and del Campo, 201; Adusei, 2012; Van Rooyen et al., 2012; Ashraf et al., 2006; Duflo et al., 2006; Benartzi and Thaler, 2004).

In the past few years, there has been an increase in joined research regarding financial inclusion and microfinance, as demonstrated by the number of articles found in the Web of Science (see Figure 1.4).

Figure 1.4 Research in financial inclusion and microfinance
(Number of publications per year)
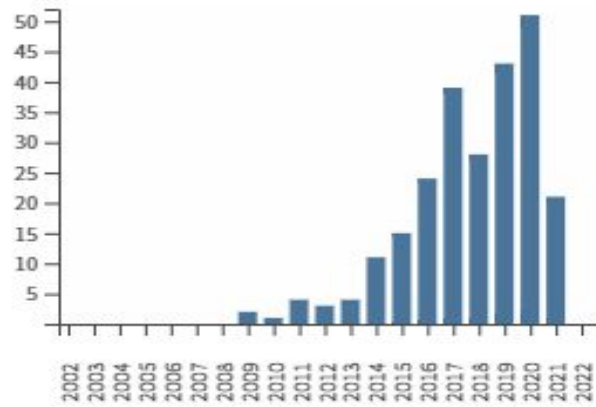
Source: Authors' own compilation using Web of Science data

1.4 Microfinance and Financial Education

Recent research shows that financial education is a key element for increasing financial inclusion. Even in developed economies, the level of financial literacy has a major impact on financial stability (Kaiser and Menkhoff, 2017; Lusardi and Mitchell, 2014). Citi Foundation (2011) suggests that most micro borrowers do not have the necessary skills to properly use their loan proceeds and many of them just use the microcredit for basic consumption needs. Sen and De (2018) point out that only a few credit beneficiaries had received any sort of financial training. For example, authors such as De Mel et al. (2014); Bali and Varghese (2013); Verrest (2013); Berge et al. (2012); Karlan and Valdivia (2011); McIntosh et al. (2011) and Gubhert and Roubaud (2005), have studied the impact of different microfinance programs implemented with compulsory training in business and conclude that financial education improves financial outcomes when given a microcredit .The strong links between financial and accounting literacy and the levels of success in managing microcredits have attracted considerable attention from researchers in the field of cooperation programs. However, research on this issue remains scarce, as demonstrated by the number of articles written about financial inclusion, microfinance and financial education found on the Web of Science (see Figure 1.5).

Figure 1.5 Research in Financial Microfinances and Financial Education (Number of publications per year)
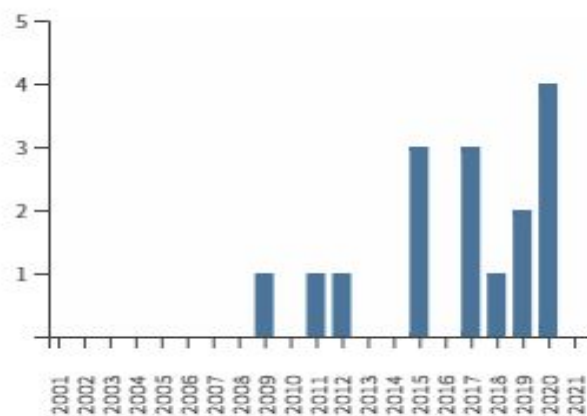
Source: Authors' own compilation from Web of Science data

In addition, financial education helps the population acquire the necessary competencies to make informed and appropriate decisions, as well as enabling them to defend their rights as financial consumers (OECD, 2019). Moreover, financially literate citizens have a greater capacity to understand economic and social policies adopted within their economies (Fernandes et al., 2014). Therefore, financial educational in poor households should be considered a key investment because it carries the potential of lifting them out of poverty (Sen and De, 2018).

In some countries, financial capability or financial literacy tends to be confused with entrepreneurship. They are different things but related: people are unlikely to be able to set up and run a business if they cannot manage their personal finances; but running a business also requires a separate set of knowledge and skills (Mundy, 2011).

Alliance for Financial Inclusion (AFI) managed to put together policy makers and regulators from 96 countries under the G20 event (Gabor and Brooks, 2016) with the purpose of creating a new framework of regulation, to integrate consumer protection and financial literacy (AFI, 2015). Risal (2018) recommends that new policies, strategies, and regulatory frameworks should be applied to MFIs regarding the level of tolerance of indebtedness of their credit beneficiaries.

Researchers agree that the impact of training programs improves when tutoring is adapted to the needs of micro-entrepreneurs. The problem is that micro-entrepreneurs in developing countries rarely use management skills in accounting or inventory control to manage their business (Urquía-Grande and del Campo, 2017; McKenzie and Woodruff, 2014). Nevertheless, it is becoming more popular for MFIs to offer non-financial services such as training in business, technical, and social skills together with financial products.

Additionally, to evaluate the impact of financial education, authors such as Kalra, Mathur and Rajeev (2015) have developed a Microfinance Clients Awareness Index (MCAI)

based in two pillars: Awareness and Skills. Awareness covers loan basics and insurance basics, Skills sub-pillar include basic computing skills, financial skills and comparing products. All together there are 13 indicators. The MCAI could be useful to compare different MFI and could permit country rankings. It can also serve as a tool to drive governmental policies.

Finally, lack of financial skills is one of the main problems for micro-entrepreneurs when managing their micro-business. Basic accounting is essential, as it provides information on which to base decisions and to plan, forecast and control (López-Sánchez et al., 2020; Fernandes et al., 2014; Tang and LaChance, 2012). It has been proven that financial education improves micro-credit beneficiaries' financial outcomes (López-Sánchez et al., 2020; Drexler, Fischer and Schoar, 2014; de Mel, McKenzie and Woodruff, 2014; Deb and Kubzansky, 2012; Karlan and Valdivia, 2011). The impact of training programs improves when tuition is adapted to the micro-entrepreneur's needs and context.

Therefore, financial education must be identified as a priority by governments and the different involved institutions. But raising financial education levels among the most vulnerable population is not easy, can be very expensive and takes time. Coordination and long-term planning among the different actors are needed.

1.5 Information and Communication Technologies (ICTs)

The world is currently under a profound digital revolution, characterized by unstoppable technological advances (Indra, 2016). This digital revolution, that comprises mobile communications and new ICT solutions, also affects microfinance industry. Mobile phones, and more concrete smartphones, have increased exponentially in recent years, mainly due to the global investment on mobile network and the design of low-price devices. Seven out of ten homes belonging to the poorest 20 per cent of the population have a mobile phone (Perlman, 2017). Access to basic infrastructure and broadband connection has also been growing rapidly. GSMA (2019) estimates that more than 82 per cent of adults in high-income economies have access to the Internet but only 40 per cent in developing countries. This percentage goes down to 28 per cent for the poorest 40 per cent of the population. SDG 9 (Industry, Innovation and Infrastructure) is the goal that reveals the largest gap between developed and developing countries. This highlights the need to accelerate investments in technology and innovation globally and to boost capacities and skills.

McKinsey and Company (2016) confirms that banks, telecom companies, and other providers are already using mobile phones to offer basic financial services to customers. "Mobil Banking" will provide the unbanked with a wider and appropriate set of digital financial products and services that will help to accelerate social development without the need for major investment or additional infrastructure.

"Mobile money", for example, allow people to make payments using their mobile phones, even with simple text-based phones and without having a traditional bank account. Moving from cash-based to digital payments has many potential benefits for both senders

and receivers. It can improve the efficiency of making payments by increasing the speed of payments and by lowering the cost of disbursing and receiving them.

Ontiveros et al. (2014) affirm that new technologies can improve financial inclusion with less expensive financial services models. Pérez-Estébanez, Urquía-Grande and Rautiainen (2017) found that micro entrepreneurial total assets are connected with the level of management accounting, ICT level and ICT adoption. The poorest in rural areas will benefit from more accessible and efficient financial services, such as branch-less banking models, mobiles payments and e-training methods, more dynamic, innovative and cost effective. Moving from cash-based to digital payments has many potential benefits for both senders and recipients. For example, payments should be digitalized, and private companies and the government should pay wages or Conditional Cash Transfers (CCT) through accounts (Raman, 2018). The enormous growth of mobile banking has created a new opportunity to expand financial services to population living in remotes areas (Ammar and Ahmed, 2016). Mobile money accounts may help reduce the gap between developed and developing economies in terms of financial inclusion. The way to increase account ownership is to improve the level of financial education, to increase trust in financial institutions and to encourage the use of mobile banking reducing the level of cash payments. Even in rural areas, many unbanked adults have devices that allow them to make and receive payments. The most important challenges ahead are to reach those who are still excluded, to increase account use in a safe way by increasing digital and financial literacy of the new account's holders.

1.6 COVID-19 and Microfinance

COVID-19 Pandemic was first reported in December 19 and in March 20 the World Health Organization (WHO, 2020) declared a global pandemic. The coronavirus has not only created a sanitary crisis but also a deep economic crisis. In other to reduce the virus transmission most countries imposed strict lockdowns. The mobility restrictions are affecting every company and person all around the world but more deeply the most vulnerable population. COVID-19 now threatens to increase extreme poverty in many countries (United Nations, 2019).

The pandemic affected Latin America and the Caribbean very severely because of the region's structural vulnerabilities: more people working in informal markets and in sectors that require physical proximity, as tourism, insufficient health care systems and finally unequal access to digital tools. The International Monetary Fund (IMF) estimated a 7.4 per cent decrease of Gross Domestic Product (GDP) in the region in 2020. The social and human costs of the pandemic have been enormous. It is estimated that more than 18 million people have been infected and about 17 million people have fallen into poverty. Peru is the worst country in the region with a 12 per cent decrease in GDP (IMF Blog, 2021).

Employment in the Latin America and the Caribbean remains below pre-crisis levels reaching an unemployment rate of 10.4 per cent in 2020. Inequality has also increased in

most countries of the region; the estimated unemployment rate for women reached 22.2 per cent in 2020. The economic and social effects of the pandemic have significantly impacted women's autonomy. The female labour force participation rate in Latin America and the Caribbean fell by 6 percentage points in 2020, losing 10 years of progress (CEPAL, 2020c). More than 55 per cent of women in the region work in the sectors most affected by COVID-19 crisis, including accommodation and food service activities sector (associated with tourism).

Despite this situation, IMF is estimating a regional GDP growth forecast for 2021 of 4.1 per cent due to better-than-expected vaccination campaigns, growth prospects for the United States and higher prices for some commodities (IMF, 2021).

During the last few months, the lockdowns have forced vulnerable population to embrace new digital technologies but this new situation presents opportunities and challenges. For example, part of the low-income population did not have or did not use banks accounts. The World Bank (2020) estimated that during 2018, 81 per cent of purchased retail in Latin American was conducted with cash. Even if they had a bank account, they withdraw the money as soon as their wages or subsidies are paid into the account. This situation is changing and Mastercard has reported that approximately 40 million people across Latin American have become banked over the past few months (MasterCard, 2020). The Governments subsidies and CCT have been critical in reducing the use of cash and encouraging the opening of new bank accounts and therefore increasing financial inclusion. Some of the programs that have been implemented recently in Latin America are:

1. Peru has just launched a National Identity Card Account. The government will open accounts using the National Identity Card (NID) numbers. The purpose of this new law is that every citizen will have a digital savings account at Banco de la Nación in line with the objectives and guidelines of the National Financial Inclusion Policy. The accounts are being used for government payments, transfers, and reimbursements, including those related to COVID-19 (El Peruano, 2021).

2. In Mexico, migrants in the United States will be able to open bank accounts remotely at Banco del Bienestar, while their families in Mexico will be able to open their own accounts and withdraw money in pesos. This new policy aims to attract both migrants and remittance recipients to the banking system and facilitate remittance transfers, which are the livelihood for many low-income households in the country.

3. New payment models are expanding throughout Latin America. Transactions are carried out with the help of resources such as the QR code which can be used, for example, to identify the payer. Brazil, Mexico and Peru have recently moved forward with multi-bank payment projects. For example:

    • In Brazil, the instant payment system, PIX, will allow to send and receive amounts in real time from a variety of media, including mobile applications.

When a payment or transfer is made, the money will immediately go to the recipient's account. The government has been using PIX to transfers subsidies related to COVID-19. These initiatives had helped to decrease of 73 per cent in the number of people with no bank account in Brazil (CEPAL, 2020b).

- Mexico's CoDi went live in early 2019. CoDi® is a platform developed by Banco de México to facilitate payment and collection transactions through electronic transfers using cell phones. CoDi® uses QR code and NFC technology to facilitate cashless transactions for both merchants and users (Banco de Mexico, 2020).

- In Argentina, despite the digital wave driven by COVID-19 pandemic, there is still a strong preference for cash. Mercado Libre, the region's largest e-commerce platform, is offering in-store cash withdrawal services through its Mercado Pago digital wallet and QR code (CEPAL, 2020a).

The current COVID-19 environment has created an unprecedented challenge for microfinance institutions, especially small and medium-sized ones, at a moment when their financial services are needed more than ever by small businesses. In response to the pandemic most MFIs around the world have tried to help their customers to cope with the new situation, easing loan conditions, postponing repayments, implementing a moratorium or loan restructuring to clients who request it. The ability of borrowers to repay loans will determine the MFI's ability to survive the pandemic. Other aspect is the reduction of lending levels. It can be caused by the reduction of client demand, increasing client risk or MFI reducing the levels of risk tolerance. This raises concerns about the impact on low-income clients who depend on microfinance for their livelihood. For the moment, this flexibility allows MFIs to avoid worse outcomes as they try to adapt and work through the crisis. However, it raises a question: For how long will these measures be sufficient?

The Consultative Group to Assist the Poor (CGAP) conducted a Global Pulse Survey of Microfinance Institutions during September to December 2020 (GGAP, 2021) with the purpose to identify the challenges that MFI are facing. More than 399 microfinance institutions participated in at least one part of the survey. The survey highlighted the risk of deterioration of loan portfolios and MFI liquidity levels. CGAP's global survey data show strong increases in the number of nonperforming and restructured loans, but also strong capitalization that mitigates the risk of insolvency in most MFIs.

Portfolio at risk greater than 30 days (CeR>30) i.e. loans more than 30 days past due has increased a 41 per cent compared to a pre-pandemic baseline of June 2019. The survey also noticed that the size of the MFI matters; small MFIs show levels of CeR>30 almost twice as high as larger institutions. If restructured loans are added to the level of CeR>30, the "distressed portfolio" by the end of May 2020 reached almost 50 per cent among their respondents.

Declining portfolio quality is not the only risk that threatens the solvency of MFIs. If there is a decline in loan demand or lenders' risk appetite that eventually reduces portfolios, MFIs may not be able to generate sufficient income to cover expenses. Finally, due to the lookdown most MFIs employees work from home or have reduced working hours forcing MFIs expanding the use of remote channels to reach clients. About one-third of MFIs participating in the survey have increased their call centre operations or their digital channels. The pandemic has highlighted the digital gap that still exists in Latin America. (GGAP, 2021).

As COVID-19 pandemic drags on, there is a growing concern about the impact on microfinance institutions (MFIs) and their clients. Many Latin-American governments responded quickly with recommendations for freezing interest, delaying loans repayments and economic subsidies for low-income population mainly provided via digital channels. The ability of borrowers to repay loans will determine the MFI's ability to survive the pandemic.

References

Alliance for Financial Inclusion (2015). "*The 2015 AFI Global Policy Forum Report: Inspiring Innovation to Advance Inclusion*" Alliance for Financial Inclusion https://www.afi-global.org/sites/default/files/publications/gpf2015_report_aw_low_res.pdf.

Adusei, M. (2012). "Determinants of credit union savings in China*". Journal of International Development, V.25, 22-30.*

Ammar, A. and Ahmed, EM (2016). "Factors influencing Sudanese microfinance intention to adopt mobile banking". *Cogent Business and Management, V3,1154257.*

Angelucci, M.; Karlan, D. and Zinman, J. (2013). "Microcredit Impact: Evidence from a Randomized Microcredit Program Placement Experiment by Compartamos Banco". *American Economic Journal: Applied Economics, V.7(1), 151–182.*

Armendáriz, B. and Morduch, J. (2010). *"The Economics of Microfinance".* 2nd ed., MIT

Ashraf, N., Karlan, D. and Yin, W. (2006). "Tying Odysseus to the mast: Evidence from a commitment savings product in the Philippines". *Quarterly Journal of Economics, V.121(2), 635-672.*

Ashta, A, and Hudon, M. (2012*)* "The Compartamos Microfinance IPO: Mission Conflicts in Hybrid Institutions with Diverse Shareholding". *Strategic Change, V.21, 331–341.*

Bali, S.R. and Varghese A. (2013). "Delivery mechanisms and impact of microfinance training in Indian self-help groups". *Journal of International Development, V.25, 11-21.*

Banco de Mexico, (2021). https://www.banxico.oanrg.mx/sistemas-de-pago/codi-cobro-digital-banco-me.html.

Banerjee, A. and Duflo, E. (2007). "The economic lives of the poor". *Journal of Economic Perspectives, V.21, 141-167.*

Banerjee, A., Duflo, E., Glennerster, R. and Kinnan, C. (2015). "The Miracle of Microfinance? Evidence from a Randomized Evaluation". *American Economic Journal: Applied Economics, V.7(1), 22-53.*

Banerjee, A., Karlan, D. and Zinman, J. (2015). "Six Randomized Evaluations of Microcredit: Introduction and Further Steps". *American Economic Journal: Applied Economic, V.7(1), 1-21.*

Bateman, M. and Chang, H. (2009). "The microfinance illusion*". SSRN Electronic Journal, DOI: 10.2139/ssrn.2385174.*

Benartzi, S. and Thaler, R. (2004). "Save more tomorrow: Using behavioural economics to increase employee savings*". Journal of Political Economy, V.112 (2), 5164-5187.*

Berge, L.I.O., Bjorvatn, K., Juniwatya, K.S. and Tungoddena, B. (2012). "Business training in Tanzania: From research-driven experiment to local implementation". *Journal of African Economies, V.21 (5), 808-827.*

CEPAL, (2020a). Comisión Económica para América Latina y el Caribe *"Universalizar el acceso a las tecnologías digitales para enfrentar los efectos del COVID-19". In*forme Especial COVID-19, Nº 7.

CEPAL, (2020b). Comisión Económica para América Latina y el Caribe. *"Enfrentar los efectos cada vez mayores del COVID-19 para una reactivación con igualdad: nuevas proyecciones".* Informe Especial COVID-19, Nº 5.

CEPAL, (2020c). Comisión Económica para América Latina y el Caribe. *"La autonomía económica de las mujeres en la recuperación sostenible y con igualdad"*. Informe especial COVID-19, Nº 9.

CGAP, (2020). CGAP Global Pulse Survey of Microfinance Institutions. https://www.cgap.org/puls.

Ciravegna, D. (2006). "The role of microcredit in modern economy: the case of Italy". *Flacso working paper, Costa Rica.*

Citi Foundation (2011.) https://www.citigroup.com/citi/foundation/

Cohen, M. (2003). *"The impact of Microfinance"* CGAP donor brief; no. 13. https://www.cgap.org/sites/default/files/CGAP-Donor-Brief-The-Impact-of-Microfinance-Jul-2003.pdf.

Crèpon, B., Devoto, F., Duflo, E. and Pariente, W. (2011). "Impact of micro-credit in rural areas of Morocco: Evidence from a Randomized Evaluation" *Policy Brief 3012. International Growth Centre.*

Cull, R.and Morduch J. (2018) *"Microfinance and economic development" Handbook of finances and Development"*. Cheltenham, UK: Edward Elgar.

Cull, R., Demirgüc-Kunt, A. and Morduch J. (2018). "The Microfinance Business model: Enduring Subsidy and Modest Profit ". *The World Bank Economic Review, V.32 (2), 221-224.*

Daley-Harris, S. (2009). *"Informe de la Campaña de la cumbre del Microcrédito 2009",* Informe 2009. Microcredit Summit Campaign, Washington, DC.

Deb, A. and Kubzansky, M. (2012). *"Bridging the Gap: The Business Case for financial capability".* Citi Foundation and GIIN.

de Mel, S., McKenzie, D. and Woodruff, C. (2014). "Business training and female enterprise start-up, growth, and dynamics: Experimental evidence from Sri Lanka". *Journal of Development Economics, V.106, 199-210.*

Demirgüc-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J. (2018). "*The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution* ". The World Bank. https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1259-0.

Ditcher, T. (2007). *"Hype and Hope: The Worrisome State of the Microcredit Movement"* Legal City Legal Magazine 26.

Drexler, A., Fischer, G., and Schoar, A. (2014). "Keeping it simple: financial literacy and rules of thumb". *American Economic Journal: Applied Economics, V.6(2), 1–31.*

Duflo, E., Gale, W., Liebman, J., Orszag, P. and Saez, E. (2006). "Saving Incentives for low- and middle-income families: Evidence from a field experiment with Hand R block". *Quarterly Journal of Economics, V.121(4), 1311-1346.*

Duvendack, M, Palmer-Jones, R., Copestake, J.G, Hooper, L., Loke, Y., and Rao, N (2011). *"What is the evidence of impact of finances on the well-being of for people?"* London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

El Peruano (2021). Ley 31120 que regula la cuenta Documento Nacional de Identidad (Cuenta DNI). https://busquedas.elperuano.pe/normaslegales/ley-que-regula-la-cuenta-documento-nacional-de-identidad-cu-ley-n-31120-1926089-1.

Fafchamps, M., McKenzie, D., Quinn, S., and Woodruff, C. (2011). "When is capital enough to get female microenterprises growing? Evidence from a randomized experiment in

Ghana ". *Policy Research Working Papers. World Bank.* https://doi.org/10.1596/1813-9450-5706.

Fernandes, D., Lynch Jr, J.G., and Netemeyer, R.G. (2014). "Financial literacy, financial education, and downstream financial behaviours". *Management Science, V.60(8),1861-2109.*

FMBBVA - Fundación Microfinanzas BBVA (2019). "*Informe de Desempeño Social* 2019". www.fundacionmicrofinanzasbbva.org.

Gabor, D. and Brooks, S. (2016). "The digital revolution in financial inclusion: international development in the fintech era", *New Political* Economy, V.22(4), 423-436.

Ghatak, M. (2000). "Screening by the company you keep: Joint liability lending and the peer selection effect ". *The Economic Journal, V.10 (465), 601-631.*

Giné, X., and Karlan, D. S. (2014). "Group versus individual liability: Short and long term evidence from Philippine microcredit lending groups". *Journal of development Economics, V.107, 65-83.*

Global Impact Investing Network (2018). https://thegiin.org.

GSMA (2019). *"Mobile Industry Impact Report: Sustainable Development Goals".* https://www.gsma.com/betterfuture/wp-content/uploads/2019/10/2019-09-24-.

Gubhert, F. and Roubaud, F. (2011). "The Impact of Microfinance Loans on Small Informal Enterprises in Madagascar. A Panel Data Analysis*". World Bank, Washington, DC https://doi.org/10.1596/27328*

Gutierrez-Goiria, J., San Jose, L. and Retolaza, J.L. (2017). "Social Efficiency in Microfinance institutions: Identifying how to improve it". *Journal of International Development, V.29, 259-280.*

Gutierrez-Nieto, B., and Serrano-Cinca, C. (2019). "20 years of research in microfinance: An information management approach". *International Journal of Information Management, V.47, 183-197.*

Haldar, A., and Stiglitz, J.E. (2016). "Group Lending, Joint Liability, and Social Capital: Insights from the Indian Microfinance Crisis". *Politics and Society, V.44(4), 459-497.*

Hermes, N. and Hudon, M. (2018). "Determinants of the Performance of Microfinance Institutions: A Systematic Review". *Journal of Economic Surveys, V.32 (5), 1483-1513.*

Hermes, N. and Lensink, R. (2011). "Microfinances: Its Impact, Outreach and sustainability". *World Development, V.39 (6), 875-881.*

Hilgert, M., Hogarh, J., and Beverly, S. (2003). "Household financial management: the connection between knowledge and behaviour". *Federal Reserve Bulletin July, 309.322* https://www.federalreserve.gov/pubs/bulletin/2003/0703lead.pdf.

Hudon, M and Ashta (2013). "Fairness and microcredit interest rates: from Rawlsian principles of justice to distribution of bargain range". *Business Ethics a European review, V.22 (3), 277-291.*

Hudon, M and Sandberg, J. (2013). "The ethical crisis in microfinances: Issues, findings, and implications". *Business Ethics Quarterly, V.23 (4), 561-589.*

Hudon, M., Labie, M. and Reichert, P. (2018). "What is a fair level of profit for a Social Enterprise? Insights from Microfinance". *Journal of Business Ethics, 162, 627-644.*

Hudon, M. Labie, M. and Szafard, A. (2019). *"A research agenda for financial inclusion and microfinance".* Edward Elgar Publishing ltd, UK.

Hulme, D. (1997). "Impact assessment methodologies for microfinance: A review" *World Development, V.28, 79-98.*

Hulme, D. and Mosley, P. (1996). *"Finance against Poverty"* (Vol 1). Routledge, London

I and C (2020). Fundación Inversion y Cooperación.

IMF Blog (2021). https://blog-dialogoafondo.imf.org/?p=14993

Indra (2016). *"El nuevo modelo de creación de valor de la Banca basado en tecnologías disruptivas"*, www.indracompany.com

Kaiser, T., and Menkhoff, L. (2017). "Does Financial Education Impact Financial Literacy and Financial Behaviour, and If so, When?". *World Bank Policy Research Working Papers WPS8161.*

Kalra, V., Mathur, H.P.and Rajeev, P.V. (2015). "Microfinance clients' awareness index: A measure of awareness and skills of microfinance clients". *IIMB Management Review, V.27, 252-266.*

Kappel, V.; Krauss, A. and Lontzek, L. (2010). "Over-Indebtedness and Microfinance–Constructing an Early Warning Index*". Working Paper, Center for Microfinance, University of Zurich.*

Karlan, D. (2007). "Social connections and group banking". *The Economic Journal, V.117 (517), 52–84.*

Karlan D. and Valdivia, M. (2011). "Impact of business training on microfinance clients and institutions". *Review of Economics and Statistics, V.93 (2), 510-527.*

Karlan, D., Ratan, A.L., and Zinman, J. (2014). "Savings by and for the poor: A research review and agenda". *Review of Income and Wealth, V.60(1), 36-78.*

Kirkpatrick, C. and Maimbo, S.M. (2002). "The Implications of the Evolving Microfinance Agenda for Regulatory and Supervisory Policy". *Development Policy Review, V.20(3), 293-304.*

Kodongo, O. and Kendi, L.G. (2013). "Individual lending versus group lending: An evaluation with Kenya's microfinance data". *Review of Development Finance, V.3(2), 99-108.*

Leatherman, S., Metcalfe, M., Geissler, K., and Dunford, C. (2011) "Integrating microfinance and health strategies: examining the evidence to inform policy and practice". *Health Policy and Planning, V.27(2), 85-101.*

López-Sánchez, P., Urquía-Grande, E., del Campo, C. and Rivero-Menendez, M.J. (2020). "The importance of accounting for micro-credit beneficiaries in developing countries". *Enterprise Development and Microfinance, V.31(4), 268-283.*

Lusardi A. and Mitchell, O.S. (2014) "The economic importance of financial literacy: theory and evidence", *Journal of Economic Literature, V.52(1), 5-44.*

Mader, P. (2017) "Contesting financial inclusion". *Development and Change, V.49(2), 461-483.*

Mader, P. (2013). "Rise and fall of Microfinance in India: The Andhra Pradesh Crisis in Perspective". *Strategic Change, V.22(1–2), 47–66.*

Maity, S. (2019) "Financial inclusion and multidimensional poverty reduction through self-help-group-led microfinance: evidence from Bodoland, Assam, India", *Enterprise Development and Microfinance, V30 (3).*

Mandell, L. and Schmid Klein, L. (2007) "Motivation and financial literacy", *Financial Services Review, V.16, 105–116.*

Marr, A. (2004). "A challenge to the orthodoxy concerning microfinance and poverty reduction". *Journal of Microfinance, V.5(2), 1-35.*

Mastercard (2020). *"The acceleration of financial inclusion during COVID-19 pandemic. Bringing hidden opportunities to light"* https://newsroom.mastercard.com/latin-america/files/2020/10/Mastercard_Financial_Inclusion_during_COVID_whitepaper_EXTERNAL_20201012.pdf

McIntosh, C., Villaran, G., and Wydick, B. (2011) "Microfinance and home improvement: using retrospective panel data to measure program effects on fundamental events". *World Development, V.39(6), 922-937.*

McKinsey and Company (2016*). "Digital Finance for all: Powering inclusive growth in emergin Economies".* McKinsey and Company (2016*).*

McKenzie, D. and Woodruff, C. (2014) "What are we learning from Business training and Entrepreneurship Evaluations around the developing world?". *World Bank Research Observer, V.29 (1) 48-82.*

Microfinance Barometer (2018). http://www.convergences.org/wp-content/uploads/2018/09/BMF_2018_EN_VFINALE.pdf.

Mookherjee, D., and Motta, A. (2016). "A theory of interactions between MFIs and informal lenders". *Journal of Development Economics, V.121, 191-200.*

Morduch, J. (2016). *"How statistics shaped microfinance".* New York University and Institute for Advances Study. IMF.

Morduch, J. (2017). *"Microfinance as a credit card".* Limn, Issue 9: Little development devices/Humanitarian goods.

Mokhtar, S.T., Nartea, G. and Gan, C., (2009). "*Determinant of Microcredit Loan Repayment Problem among Microfinance Borrowers in Malaysia*". http://www.microfinancegateway.org/gm/document-1.9.57549/.

Morris, M.H., Santos, S.C. and Neumeyer, X. (2018). "*Poverty and entrepreneurship in developed economies*". Cheltemham, UK: Edward Elgar Publishing.

Mundy, S. (2009) "Financial education programmes in schools". *OECD Journal: General Papers* 2008(3), 53–127.

Mundy, S. (2011) *Financial Capability: Why Is It Important and How Can It Be Improved*? CfBT Education Trust. Berkshire, UK.

OECD (2019) *PISA 2018 "Assessment and Analytical Framework PISA".* OECD Publishing, Paris <https://doi.org/10.1787/b25efab8-en>.

Ontiveros, E, Martín Enriquez, A and Lopez Sabater, V. (2014*) "Microfinanzas y TIC. Experiencias Innovadoras en Latinoamérica".*
Fundación Telefónica and Analistas Financieros Internacionales (AFI).

Pérez-Estébanez, R., Urquía-Grande, E. and Rautiainen, A. (2017). "Technological and Economic Factors Determining ICT Level: Evidence from Rural Micro- Businesses in Democratic Republic of Congo*". Journal of International Development, V30 (1), 118-133.*

Pellegrina, L.D. (2011). "Microfinance and Investment: A comparison with bank and informal lending". *World Development, V.39(6), 882-897.*

Perlman, L., (2017). *"Technology inequality. Opportunities and Challenges for mobile Financial Services"*. Centre for Financial inclusión.

Pitt, M., and Khandker, S.R. (1998). "The impact of group-based credit programs on poor households in Bangladesh: Does the gender of participants matter?". *Journal of Political Economy, V.106 (5), 958-996.*

Pollin, R., and Feffer, J. (2007). *"Microcredit: False Hopes and Real Possibilities. Is microcredit the solution to global poverty? Yes and no...."*. Foreign policy in Focus. https://fpif.org/microcredit_false_hopes_and_real_possibilities/.

PovcalNet (2020). *"Poverty and Shared Prosperity 2020"*. World Bank Development Economics division. http://iresearch.worldbank.org/PovcalNet/home.aspx.

Prahalad, C.K., and Hammond. A. (2002). "Serving the world's poor profitably". *Harvard Business Review Sept 02, RO2095.*

Raihan, M. and Uddin, M.J. (2018). "Creating women's capabilities through microcredit in Bangladesh". *Sri Lanka Journal of Social Sciences, V.41(2), 111–122.*

Raman, A. (2018). *"India Moves Toward Universal Financial Inclusion"*. CGAP Blog August 2018.

Risal, N. (2018). "Microfinance position and indebtedness: empirical evidence from microfinance institutions in Nepal". *Pravaha, V.24, 120–36.*

Roodman, D (2012). *"Due diligence-An Impertinent Inquiry into microfinances"*. Washington DC. Centre for Global development.

Roodman, D. and Morduch, J. (2014). "The impact of microcredit on the Poor in Bangladesh: Revising the Evidence". *Journal of Development Studies, V.50 (4), 583-604.*

Schicks, J. (2013). "The definition and causes of microfinance over-indebtedness: a customer protection point of view". *Oxford Development Studies, V.41(1), S95–S116.*

Schicks, J. (2014) "Over-indebtedness in microfinance: an empirical analysis of related factors on the borrower level", *World Development, V.54, 301–24.*

Sen, G.and De, S. (2018). "How Much Does Having a Bank Account Help the Poor?". *The Journal of Development Studies, V.54 (9), 1551-1571.*

Shivaprasad, G. (2020). "Role of microfinance-Transforming the social conditions of women SHG". *Test Engineering and Management, V.83, 2668-2680*

Simanowitz, A. and Walther, A. (2002). "Ensuring Impact: Reaching the Poorest while building financially self-Sufficient institutions and showing improvement in the lives of the poorest families*". Occasional Papers. 23745. University of Sussex.*

Solo, T.M. (2008). "Financial exclusion in Latin America or the social cost of non banking the urban poor". *Institutional Environment and Development, V.20,46-66.*

Tang, N. and LaChance, M. E. (2012) "Financial Advice: What About Low-Income Consumers?". *Journal of Personal Finance, V.11(2), V.121-158.*

Tarozzi, A., Desai, J. and Johnson, K. (2015). "The Impacts of Microcredit: Evidence from Ethiopia*". American Economic Journal: Applied Economics V.7(1), 54-89.*

United Nations (2015). "Transforming our World: The 2030 Agenda for Sustainable Development". https://sustainabledevelopment.un.org/post2015/transformingourworld/publication

United Nations (UN) (2019). http://www.un.org/es/index.html.

Urquía-Grande, E. and del Campo, C. (2017). "Socio-economic factors determining the commitment to participate in an agricultural development project in rural Ethiopia" *Iberoamerican Journal of Development Studies, V.6(2), 4-27.*

Urquía-Grande, E., Rautiainen, A., and Pérez-Estébanez, R. (2017). "The effectiveness of rural versus urban non-profit organisations in the Democratic Republic of Congo". *Third World Quarterly, V.38(9), 2129-2142.*

Van Rooyen, C., Stewart, R., and De Wet, T. (2012). "The impact of microfinance in Sub-Saharan Africa: a systematic review of evidence". *World Development, V.40, 2249-2262*

Verrest, H. (2013) "Rethinking micro entrepreneurship and business development programs: vulnerability and ambition in low-income urban Caribbean households". *World Development, V.47, 58–70.*

Vogelgesang, U. (2003). "Microfinance in times of crisis: The effects of competition, rising indebtedness, and economic crisis on repayment behaviour". *World Development, V.31(12), 2085-2114.*

WHO, (2020) World Health Organization https://www.who.int/es

World Bank (2021) https://databank.worldbank.org/home.aspx.

Yunus, M. (2003) *"Banker to the Poor Micro-Lending and the Battle Against World Poverty"*. Perseus Book LLC.

2

Chapter 2. Mind the Gap in Financial Inclusion! Microcredit Institutions fieldwork in Peru[3]

Abstract

Financial inclusion remains a key political issue. Since microcredit first captured public attention, Microfinance Institutions (MFIs) have expanded rapidly all around the world. Although much economic and financial literature has highlighted the importance of microfinance as a factor of development, there is also an intense debate about its effectiveness as a development tool. This chapter is a descriptive analysis of the microcredit state of the art contrasted with the fieldwork done in Peru. A qualitative research methodology was used; 29 in-depth face-to-face interviews with different microfinance agents: MFIs, NPOs, microfinance associations, and microfinance customers in Peru. Peru has been chosen because it has a dynamic and well-regulated microfinance sector with more than 70 entities specialized in microfinance. Though statistical generalization is not possible, interview data provides rich and contextual evidence, which is often missing from a quantitative research approach. This chapter highlights the importance of financial and accounting education in microcredit beneficiaries and how it can be enhanced in the digital age. COVID-19 pandemic has forced vulnerable population to embrace new digital technologies and has highlighted the digital gap that still exists in Latin America but this situation presents opportunities and challenges.

This present study contributes to the debate over how to improve microcredit intervention's impact on the more vulnerable and identifies some unique insights into the interrelationships of financial education and financial inclusion. The results of the present study confirm that financial and accounting education are key elements in financial inclusion.

Keywords: financial inclusion, microfinance institutions, economic development and financial education.

2.1 Introduction

The Microfinance industry was born to fill the gap in financial inclusion of the most vulnerable population. Financial inclusion has been broadly recognized critical in alleviating poverty and achieving inclusive economic growth. It is in this context that Muhammad Yunus developed the idea of microcredit in early 80s in Bangladesh. This concept consisted in giving small loans to the bottom of the pyramid with the objective of improving their quality of life (Yunus, 2003). The primary purpose was to provide an alternative to the oppressive regime of traditional money lenders. In the following decades, microfinances institutions (MFIs) started offering a wider range of financial products and undergone a tremendous change from NPOs (Non-Profit Organizations) to regulated financial entities improving the level of efficiency and sustainability (Bibi et al., 2018; D´Espallier et al., 2017; Gutierrez-Goiria et al., 2017), but at the same time losing part of their initial mission.

Today, Yunus's vision is being questioned and the impact of microcredit on marginalized people remains debated. Although much economic and financial literature has highlighted the importance of microfinance as a factor in development, there is also an intense debate about its effectiveness as a development tool. Morduch (2017, page 1) argue that "Microfinance has proved robust as a banking idea but not as an anti-poverty intervention". Pollin and Feffer (2007, page 1) also concluded "Making credit accessible to poor people is a laudable aim. But as a tool for fighting global poverty, microcredit should be judged by its effectiveness, not good intentions". A variety of studies provide evidence that other factors are also very important to explain poverty reduction such as: quality of the institutions, monetary stability, sustained growth, job creation, foreign trade (Acemoglu and Robinson, 2012; Rodrik et al., 2004); social policies based on conditional cash transfer (CCT), and so on (Biderbost and Jiménez, 2016).

In addition, donors and governments are demanding more evidence of the effectiveness of development aids experiences (Van Rooyen et al., 2012; Hermes and Lensink, 2011; Biderbost and Jiménez, 2016). Researchers are making great efforts to provide evidence of the impact of microfinance, but in general it is difficult in social sciences to provide robust evidence (Lacalle and Rico, 2007; Hulme, 1997). Some researchers even suggest that microcredit can have a negative impact on the most vulnerable and suggest that employment, not microcredit is the solution (Blattman and Ralston, 2015; Bateman and Chang, 2009; Karnani, 2007, 2006), or that the impact is very limited (Cull, et al., 2018; Prahalad and Hammond, 2002). Recent research suggests that the low impact of micro credits in the life of the poor can be among others partly due to the low level of financial education (De Mel et al., 2014; Karlan and Valdivia, 2011). Therefore, the microfinance model must be reviewed in order to identify the key factors that might help to increase the impact on the more vulnerable with a broader view. What really matters is identifying the conditions under which MFIs work best, what is the most adequate model, technology, and institutional environment for microfinance institutions and their clients.

Undeniably, there is a close relationship between economic development and financial inclusion (Deb and Kubzansky, 2012). That is the reason why financial inclusion remains a key political issue and eradicating poverty in all its forms is one of the primary goals of the United Nations (UN) 2030 global agenda. The United Nations Development Programme (UNDP) main objective is to strengthen the rule of law and promote human rights. One of the stated objectives is "Access to finance by poor and vulnerable groups is an important tool for poverty reduction". Such access can empower them by building their asset base, support income-generating activities and expand their range of choices. In this context, the purposes of this chapter are to understand the effectiveness of microfinance institutions in alleviating poverty, and to identify current challenges to improve impact on microcredit beneficiaries. However, single solutions continue to be inadequate in confronting the prevalent problems of poverty (Leatherman et al., 2011).

This chapter includes in the first part a bibliographic review and contextualisation of microfinance industry in Peru. In the second part we cover the fieldwork carried out in Peru. This consisted of 29 semi-structured interviews and face to-face discussions done with different microfinance agents: MFIs, NPOs, microfinance associations and microfinances customers. The 29 interviewers have been carefully selected based on their specific roles allowing us to get a full picture of the microfinance market in Peru.

We chose Peru because it has a dynamic and well-regulated microfinance sector compared with other countries in Latin America. Currently, there are over 70 entities specialised in microfinance with an outstanding loan portfolio of US$ 10.8 billion and more than 5 million borrowers (Microfinance Barometer, 2018). Following the advice of BBVA Microfinance Foundation, that has several MFIs all over Latin American countries, we selected three MFIs in Peru due to the differences in size and organizational models. We visited MiBanco, which is the largest MFIs in Peru, and Financiera Confianza (FC), together they have more than 40 per cent of market share. Representing the world of NPO we visited ADRA, an international organization focused on women savings groups. We examined their commercial models, target segments, offered services and their potential for archiving their mission of alleviating poverty. In addition, we selected the more active MFIs Associations and finally, to better understand the microfinance context, we also visited some microfinance customers in the area of Lima. Lastly, we highlight our findings and define interesting recommendations and conclusions that emerged from our research study. This present study contributes to the debate over how to improve microcredit intervention impact on the more vulnerable and identifies some unique insights into the interrelationships of financial education and financial inclusion.

Hence, the main aim of the chapter is to find the answer to the following research question:

RQ 2.1: What do Microfinance actors claim are the key factors for improving financial inclusion?

2.2 State of the art

2.2.1 Peru context

We chose Peru because it has a dynamic and well-regulated microfinance sector. The microfinance industry in Peru has contributed to the development of the Peruvian economy and benefited the general population. Over the past decade, Peru has been one of the fastest-growing economies in South America, with an average annual GDP growth rate of 5.9 per cent (World Bank, 2019). Currently, there are over 70 entities specialised in microfinance. In relation to Government and Policy Support for Financial Inclusion, Colombia and Peru hold the top two spots in 2019 in the overall rankings developed by Global Microscope on Financial Inclusion. This index analysed the working environment for microfinance, the regulatory system, the competitive and innovative market, and client protection. Part of Peru's success in microfinance can be attributed to prudent regulation and strict supervision, balanced with limited government intervention (Chen, 2017).

The Peruvian economy, the seventh largest in Latin America, has experienced a structural change in the past three decades. Currently, the services sector is the main contributor to the country's GDP driven by telecommunications and financial services, which together account for nearly 40 per cent of GDP. In addition, Peru ranks on the top countries in terms of entrepreneurship (Global Entrepreneurship Monitor, 2019). However, the country still has a long way to go towards modernisation and competitiveness. In addition, competition has increased significantly in recent years, pushing MFIs to improve efficiency and sustainability. Although the rate of non-performing loans and write-offs has decreased, there are still a 10 per cent of non-performing loans.

The use of cash is extensive throughout the region, owing to the high level of informal business in Peru. Half of the population receive their wages in cash and, in terms of transactions, 96 per cent pay for services and invoices with cash. In addition, people with an account do not use it frequently; only 17 per cent make regular transactions throughout the month, while this percentage rises to 65 per cent in more developed countries. Peru accounts for one of the most successful collaborative initiatives between financial institutions, government and telecommunication companies: the design and construction of a shared infrastructure for mobile payments called BIM. BIM is a digital app for making payments via mobile phones that aims to reach the unbanked in remote areas.

Microfinance institutions are present at the national level, with a growing number of new agencies, correspondent's agents and the 'shared window' network run by the "Banco de la Nación". These new initiatives have allowed MFIs to reach people living in rural and remote areas who were previously excluded from financial services.

At the end of 2018, the total loan proceeds reached 45,308 million soles, representing an increase of 8.7 per cent from the previous year. The non-performing loans were 5.83 per cent.

Microcredits to small businesses and micro-enterprise comprised 42.88 per cent of the total loan proceeds. In terms of customers, MFIs provided 36.27 per cent of credit to small businesses followed by Cajas Municipales with 34.56 per cent and MiBanco with 19.68 per cent (ASOMIF, 2019).

2.2.2 Financial inclusion in Peru

The Microfinance industry was born to fill the gap in financial inclusion of the most vulnerable population. Since Grameen Bank was created in 1983 Microfinance Institutions (MFIs) have expanded rapidly all around the world with the primary mission to alleviate poverty by giving small loans, primarily to female entrepreneurs (Yunus, 2003). According to the Microfinance Barometer 2018, MFIs reached in 2017, 139 million low-income clients with a loan volume of US$114 billion.

Latin American countries comprise half the list in terms of volume of credit. Peru, with a total volume of US$10.8 billion, ranks first in Latin America and second after India. India and Bangladesh are top of the list in terms of the number of beneficiaries. (Microfinance Barometer 2018)

Account ownership is one of the most common indicators for establishing the level of financial inclusion. In 2011, the World Bank (WB) launched a Global Findex database that covers more than 140 economies (Demirgüc-Kunt et al., 2018). The 2017 database shows that more people in Peru have gained access to financial services. Bank account ownership has increased from 20 per cent in 2011 to 43 per cent in 2017. Both banks and non-banks increased their presence in rural areas and also helped the new channels such as mobile money and online platforms. Indeed, much of the progress can be attributed to the financial inclusion policies taken place after the Maya Declaration, which set a target of 75 per cent account ownership by 2021 (AFI, 2015). Notwithstanding considerable progress, gaps remain. For example, the number of bank accounts in Peru are below the Latin America average of 54 per cent and below the world global average of 69 per cent. Gender gap in account ownership remains. The difference between men and women not having an account was 17 per cent in 2017 (Demirgüc-Kunt et al., 2018). In Peru, a large poor population live in remote areas and the only way to access financial services is by using new technologies, such as digital payment or mobile money accounts. During the pandemic, the Peruvian government has opened accounts using the National Identity Card (NID) numbers in Banco de la Nación with the purpose that every citizen will have a digital savings account. The accounts are being used for government payments, transfers, and reimbursements, including those related to COVID-19 (El Peruano, 2021).

Moving from cash-based to digital payments can have many potential benefits for both senders and recipients (Ontiveros et al., 2014) but the rural poor use of their bank accounts is very limited due to financial illiteracy and other problems (Sen and De, 2018).

The enormous growth of mobile banking has created a new opportunity to expand financial services to population living in remotes areas (Ammar and Ahmed, 2016). Mobile money accounts may help reduce the gap between developed and developing economies in terms of financial inclusion. The way to increase account ownership is to improve the level of financial education, to increase trust in financial institutions and to encourage the use of mobile banking reducing the level of cash payments. Even in rural areas, unbanked adults have devices that allow them to make and receive payments. The most important challenges ahead are to reach those who are still excluded, to increase account use in a safe way by increasing digital and financial illiteracy of the new account's holders.

As COVID-19 pandemic drags on, there is a growing concern about the impact on microfinance institutions (MFIs) and their clients. Many Latin-American governments responded quickly with recommendations for freezing interest, delaying loans repayments and economic subsidies for low-income population mainly provided via digital channels. The ability of borrowers to repay loans will determine the MFI's ability to survive the pandemic.

2.2.3 Financial Education

The lack of financial skills is one of the main problems for micro-entrepreneurs when managing a micro-business. Basic accounting is essential, as it provides information on which to base decisions, and to plan, forecast and control (Fernandes et al., 2014; Tang and LaChance, 2012).

Most researchers agree that the impact of training programmes improves when tuition is adapted to the needs of micro-entrepreneurs. For over a decade, Freedom from Hunger (FFH) in cooperation with different MFIs all around the world have offered an integrated financial and education product, called *Credit with Education* for population in the bottom of the pyramid. *Credit with Education* services focus on group lending for women because of their economic and domestic roles within the household. It provides participants with small loans, and education in business management and other topics such as health and nutrition. Evidence from *Credit with Education* programs indicates that many of the desired impacts have been achieved. The key figure is the field agent that are usually from the local area and responsible for providing training during the regular association meetings. Their role is to be a facilitator, not a teacher. This methodology is very interesting but is not scalable given that customers live in remote rural areas and field agents must cover long distances with poor infrastructure. The main training contents are health, food and basic business skills. Business education introduces women to the concepts of "profit and loss," "adding value," "managing money," "selling strategies," "market evaluation," "inventory management" and more (Fiala, 2018). Vor der Bruegge et al. (1999) have done a cost analysis of three years of four different *Credit with Education* programs to estimate the cost of education in addition to the cost of village banking. They come out to the figure that the cost of education is between 6 and and 10 per cent of the total cost of the programme. For example, the annual cost per served client in

Bolivia was $63.82. The cost analysis suggests that eliminating the "extra education" could only save $3.51 per client per annum.

In the same line, *Microfinance-Plus programs* are becoming more popular among MFI´s. They also offer non-financial services (training in business, technical and social skills) in addition to financial services (credit, savings, insurance, transfer and payments). In this line, Garcia and Lensink (2019) analysed a sample of 478 MFIs in 77 countries. Twenty-five per cent of the MFIs offer business services together with microcredits to improve managerial process (accounting, finance, marketing, etc). The problem is that micro entrepreneurs in developing countries rarely use management skills as accounting or inventory control (McKenzie and Woodruff, 2014).

Therefore, financial education must be identified as a priority for governments and the different institutions involved. But raising financial education levels among the most vulnerable population is not easy, could be very expensive and takes time. Coordination and long-term planning among the different actors are needed.

2.3 Methodology

Our research methodology followed qualitative, descriptive and interpretative case research (Vaivio and Sirén, 2010; Lacalle and Rico, 2007). The research is based on data analysis, a review of the literature and semi-structured interviews and discussions with key microfinance actors in Peru. We selected Peru for our fieldwork because it has a dynamic and well-regulated microfinance sector. The fieldwork carried out in Peru consisted of 29 semi-structured interviews and discussions done face-to-face with different microfinance agents: MFIs, NPOs, microfinance associations and microfinances customers. We analysed three MFIs that were selected due to their differences in size and organizational models. Finally, to better understand the country context, we also visited some microfinance customers in the Lima area. The summary of these interviews is in section 4. Several types of data (mixed data) have been used. We have gathered information directly from the interviewees and observation in an exploratory and inductive manner (Rautiainen et al., 2017; Taylor and Bogdan, 1984). To offset any subjectivity and support our analysis, we analysed multiple recent reports and research studies such as Global Microscope on Financial Inclusion (2019), Microfinances Barometer (2018), Global Entrepreneurship Monitor (2019) and the Global Findex (2017). Though statistical generalizability is not possible, in-depth interview data provides rich and contextual evidence, which are often missing from a quantitative research approach (Yong, 2019). Differences in training practices at MFIs may reveal differences in the underlying financial inclusion and impact of microfinance. The possible interviewees bias is reduced after two hours of face-to-face interviews with the researcher.

Furthermore, our analysis is based on understanding the behaviour of organisational actors, which was gained by observations during the interviews and through discussions, meetings, emails, phone calls and qualitative analysis of follow-up interviews about training

and microfinance. We focused on four areas: financial inclusion, financial education, selection and monitoring of beneficiaries, and strategies for addressing technological innovations.

2.4 Case-study fieldwork research

We visited three MFIs in Peru: MiBanco, which is the largest MFIs in Peru, Financiera Confianza (FC), and ADRA. Three microfinance associations were also interviewed and finally, five NPOs working in the sector of microfinances (See annex 2.1 for the technical sheet of interviewers). Our findings are analysed and discussed in this section. Finally, recommendations for the future are defined. Interviews were carried out in Spanish and the selected extract translated into English by the authors.

2.4.1 Microfinance institutions

2.4.1.1 MiBanco

MiBanco, with a 25 per cent market share, is one of the leading microfinance institutions in Peru. It is the result of the merger of Financiera Edyficar and MiBanco in 2014 and its mission is to transform the lives of customers through financial inclusion, thus contributing to the economic growth of Peru.

MiBanco has more than 714,400 customers, who are mainly micro and small entrepreneurs. It is the largest institution offering loans in the 0-150 thousand soles range, with a market share of 26.07 per cent in this segment. It has the biggest branch network in Peru, with 328 branches across the country and 5,713 credit officers. It also accounts for the largest network of collaborators (10,130) in Peru.

Interviewee 1 informed us that, in order to increase the impact of microcredits, they also offer a wide range of non-financial services, including financial education. Some examples of recent initiatives in this area are first, the university exchange programme MiConsultor, which provides consultancy services for micro-entrepreneurs and the virtual education through the 'Campus Virtual Romero'. Second, financial education workshops jointly developed with the German Foundation focused on improving the use of cash and budgeting process of credit beneficiaries. Third, a program developed together with the Inter-American Development Bank's Multilateral Investment Fund (MIF) that grants US$3 million to a project that will provide training to more than 100,000 women micro entrepreneurs and small business owners in Peru. Half of Peru's GDP is generated by small and microenterprises, and women lead over 40 per cent of these companies. *"Investing in these women makes good business sense for the Peruvian economy and for the microfinance industry" (Interviewee 1).*

"We are also worried by the increase in competition that is causing high customer rotation and over indebtedness. Banking agents, who have direct contact with the customers,

are key figures in MiBanco and training programmes focused on retention of these agents, are also being developed" (Interviewee 1).

2.4.1.2 Financiera Confianza (FC).

Financiera Confianza (FC), that belongs to Banco Bilbao Vizcaya Argentaria Microfinanzas Fundation (FMBBVA), is one of the leading microfinance entities in Peru. It has 149 branches across the whole of Peru and serves around half a million customers. FC provides a wide range of financial products and services, including financial education. They primarily focus on women and young people under 30, which are the population with the highest poverty rates.

FMBBVA has developed a new methodology called Productive Finance that allows loan officers to reach the entrepreneurs with all the information using tablets; it is like carrying the branch office in a mobile device. They share a cloud technology solution, a banking hub with multi-device mobile that allows them to provide online services, document digitalization and collect data. The platform helps them to do the follow up and realize impact assessment (Interviewees 2 and 3).

During the interviews they shared with us their customer profile and strategy.

"The characteristics of our customer base are: 60 per cent are women, 45 per cent have primary education, 32 per cent live in rural areas and only 19 per cent are under 30 years old. We focus on women because they are more vulnerable, are considered better administrators than men and are more concerned about their families. We believe that supporting women means supporting the following generations. Although women account for 60 per cent of the group's customers, they only represent 54 per cent of the total credit amount" (Interviewee 4).

They also described the important role and challenges of the frontline officers.

"Frontline officers or banking agents are key figures in MFIs, because they have direct contact with the customers. They have variety of functions: identify and provide information to potential customers, develop together with the customer the loan applications, and provide financial education to customers" (Interviewee 5).

Financiera Confianza (FC) focused its efforts in 2017 on retention and training programmes for banking agents. One of these programs was developed by Food for Hunger (FFH). It was an integrated education program within the MFIs to improve skills to frontline officers in several regions. The courses cover consumer protection, group facilitation techniques for delivering non-formal education and microcredit product management on line. In addition, to improve the capacities of supervisors and branch offices coordinators, the Foundation has developed a "School for Managers" program certified by ESAN University, in Peru that teach part of the content and validate skills in risk management, personnel

management, sustainability, commercial strategy, client experience and new technology trends (Interviewee 5).

They highlighted the importance of financial education. FMBBVA believes that education is the only mechanism that can help improve micro-finances impact and reduce vulnerability; therefore, they have developed different education programmes. Some examples of lending with training programmes are shown below:

- *'Palabra de Mujer programme' is* a group-lending product designed for vulnerable women, includes financial training given at each monthly payment meeting. These trainings are run by branch managers and banking officials trained in conducting financial education (Interviewee 5).
- *'Ahorro para todos programme' (APT)* is a group-saving product with a financial education component, which is also designed for women in rural areas who want to improve their standard of living. Since launched, *APT* has gained more than 2,850 clients and trained more than 13,700 people in financial issues. The education programme uses puppets and theatre games to teach savings culture through play, and are also held in Quechua, which is the women's native language (Interviewee 5).
- *'Echemos Números programme'* operated by Bancamía (Colombia). This programme provides the necessary skills for better money-management and to make better financial decisions. The programme includes financial assessment and/or face-to-face workshops given by the field agents (Interviewee 6).

One of the issues that arose in the interviews was the long process to assess the credit rating of customers given that they do not have any accounting records and work in the informal economy.

Front-line officers work with customers try to produce pro-forma financial statements and complete the credit application forms (Interviewee 5).

Finally, they are also concerned about the low customer retention rate that most MFIs are facing, which has been partially caused by the increase in competition and lack of financial education.

This is a common problem for MFIs. The retention rate of micro-entrepreneurs is very low. It has been proven that in order to increase the microcredit impact customers should stay with the institution longer periods. *"Clients, who were poor when they joined Financiera Confianza, crossed the poverty threshold after two years of working with the institution"* *(Interviewee 4).*

2.4.1.3 Microfinance Customers. San Juan Próceres FC Branch, Lima, Peru

We visited three customers of Financiera Confianza (FC) in their premises and followed a semi-structured interview (Annex 2.2). They all have a long relationship with FC and agree

that the financial education provided with the credit by FC has been a key element in managing their finance and their business.

Customer 1. Motor Bike Taxi

"We have a long relationship with FC and agree that thanks to the support and credits provided by FC we have been able to make our business grow in a sustainable way" *(Interviewee 7).*

Customer 2. Retail Shop and Taylor made clothes

"We mostly appreciate the support given by the credit officers, helping us to make the credit application and providing business and financial training" (Interviewee 8).

Customer 3. Shoe repair Shop

"Regarding accounting, the formal accounting is done by an external firm, but we keep control of records by hand. We agreed that an accounting app could be helpful, but we are afraid to lose the control of our information" (Interviewee 9).

1.4.1.4   ADRA Peru

The third institution we visited was the Adventist Agency for Development and Assistance Resources (ADRA). This is one of the largest non-governmental aid organisations in the world, with a presence in more than 120 countries. It has worked in Peru since 1965 and focuses on projects that benefit people in poverty.

"Our microfinance project uses a community-banking methodology that focuses on female entrepreneurs. This model combines communal loans with education. The educational component focuses on all areas of client development, including the family, the community and business. Currently ADRA has more than 17,000 female customers, of whom 12 per cent live in rural areas and the rest in peri-rural areas" (Interviewee 10).

2.4.1.5 Banco de la Nación, Peru

Banco de la Nación is a stated own bank with the largest branch network in Peru whose mission is to provide financial services to citizens also living in rural remote areas and to promote financial inclusion through modern technology and self-sustaining management.

Within the framework of the state's social inclusion policy, the Bank plays an important role in vulnerable populations, thanks to its important infrastructure with multiple channels throughout the national level. Most MFI´s used this wide network to reach their customers. In addition "the share window network" plays an important role in money transfers granted by

the government in relation to Social Programs (CCT) : JUNTOS, Pension 65 and Contigo (Interviewee 11).

2.4.2 Microfinance associations

2.4.2.1 CEFI-ASBANK

CEFI is a non-profit educational organisation, belonging to ASBANC, the Peruvian Banking association. It provides financial education, specialisation, research and other services that enhance financial skills. It also promotes government specialisation and modernisation in areas that can impact financial inclusion and competitiveness of the country.

CEFI collaborates in designing and providing different education programs depending on the level of poverty, location, gender, and special situations but is difficult to value the level of the acquired financial skills (Interviewee 12). Some examples of these programs are:

1- "CUNA más" is a program developed by the Ministry of Development and Social inclusion (MIDIS) whose objective is to improve the health of children under three years in extremely poor areas. They provide information regarding, health, nutrition, early learning skills.

2- "Programa Juntos" is one of the most important Conditional Cash Transfer (CCT) government program launched in Peru in 2005. The program was targeted to the most vulnerable population in rural areas. The condition to get the CCT was that parents of children of less than five years must take their children to regular health checks. The training was done in schools, social places or private houses and the objective was to get a minimum education to be able to set up a business and graduate from CCT programs. The problem is that there are not enough instructors. Recently in 2017 CEFI developed a training programme targeted to graduates of the CCT, "Programa Juntos" focus on basic accounting, and cash-flow management. The first experiment took place in Piura in collaboration with the University of Piura and the results were very challenging. They considered that most of the people that attended the training program was prepared to set up their own business and apply for a micro-loan (Interviewees 12 and 13).

CEFI also produces financial education training material: *"Aprendiendo a cuadrar cuentas", "Finanzas en mi colegio", "Historietas de Educación financiera"and "Plan de Negocio".* All these materials cover the following issues: Differentiate family and business accounts, how to use a savings account, improving trust in financial institutions, basic accounting (recording transactions, cash-flows and budgeting process) and selling and marketing.

2.4.2.2 COPEME

COPEME, founded in Peru in 1991, is a decentralised network of NGOs that aims to strengthen micro and small enterprises through business development services and inclusive microfinance. Institutions associated with COPEME are NPOs located across the country and are dynamic agents in their local economies. COPEME channels international cooperation development projects.

COPEME's long experience in public policy allows them to suggest best practice intervention models but they are not happy with the achievements in financial inclusion although there is a National plan where most players are involved. Financial education and MFI Institutional sustainability are the main pillars of the National plan (Interviewee 14).

Over the past few years, COPEME has run cooperative projects for managing risks in small and medium-sized MFIs and for developing technologies for financial inclusion (TEC-IN). The purpose of this programme is to increase financial inclusion using mobile phones and computer technology. These programmes aim to lower the costs of access to financial services in the rural population through mobile devices, including phones and computer systems. The project incorporates databases from COPEME's strategic partner EQUIFAX regarding non-conventional customers, including records to credit providers and services in rural areas. This makes it easier to make risk assessments of potential customers (Interviewee 14 and 15)**.**

2.4.2.3   ASOMIF

ASOMIF Peru is the national association of regulated non-bank financial institutions and has been a key figure in the definition and implementation of e-money in the Peruvian microfinance sector. ASOMIF's member organisations serve over 3.5 million clients with a loan portfolio of over US$10.3 billion. ASOMIF also assists its members with client education initiatives. Its mission is to help their associates achieve sustainable growth, represent them in national and international institutions and provide members with a portfolio of services.

One of the most successful collaborative initiatives between financial institutions, government and telecommunication companies, has been the construction of a shared infrastructure for mobile payments. The design and implementation of the BIM project '*billetera móvil'* aims to reach the unbanked in remote areas. BIM is a digital app for making payments via mobile phones. Although moving from cash to digital payments is difficult in developing countries it must be promoted because of the potential benefits for both senders and recipients. In addition, it can improve efficiency and security of the transactions. The platform also aims to promote savings.

Other initiatives of the Peruvian Government's superintendent of Banking, Insurance and Pension Funds (SBS) to prevent over-indebtedness is an online tool that allows users to monitor the status of their debts. This includes five-year of credit information: rating, total debt, interest paid from different institutions. Although the tool is freely available only a 10 per cent of borrowers in 2017 checked their information (Interviewee 16).

2.4.3 Other Non-profit Organisations (NPOs)

2.4.3.1 BBVA Microfinance Foundation (FMBBVA)

BBVA Microfinance Foundation (FMBBVA) is a non-profit entity belonging to the Spanish bank *Banco Bilbao Vizcaya Argentaria* (BBVA). FMBBVA operates in five countries in Latin America, through six MFIs. In 2018 the group signed off USD 1,44 billion in credits to 2 million vulnerable entrepreneurs. It is the biggest philanthropic organization in the region (FMBBVA, 2019).

The purpose of the Foundation is "to promote sustainable and inclusive economic and social development for disadvantaged people through Responsible Productive Finance" (FMBBVA, 2019). *"We have been awarded for our contribution to SDG5 "Gender Equality" during the "ODS Awards", for designing a specific and innovative strategy for the 1.2 million women in Latin America" (Interviewee 17)*

"Another of the Foundation's initiatives is to promote good corporate governance and we have designed a Code of Corporate good practices. This Code provides a set of standards and principles for board members and management of microfinance institutions with are fundamental to translate principles of good corporate governance into practical action" (Interviewee 17).

"The Foundation has developed a cloud technology solution, with multi-device mobile system that allows us to collect data in order to generate social impact indicators and obtain impact assessment. Every year we publish the "Social Performance Report" with complete information of the actions and results of the six institutions belong to the group (FMBBVA, 2019) (Interviewee 18 and 19).

2.4.3.2 CODESPA

CODESPA is a Development NGO with more than 30 years of experience. Formed by a group of professionals and experts in different disciplines committed to the development of all areas of life (economic, social and human) of the poorest people.

In Peru, CODESPA is mainly working with the tourism sector helping art-craft entrepreneurs in extremely poor areas to understand their business and their value proposition. They were also involved in an entrepreneurship project that consisted in a $1,000 grant together with education. The training was done by CEFI using a new gamming methodology.

It covered the development of a business plan and was given individually. More than 1,200 people attended, and the experience was very promising given than in a few years period a high percentage of the companies that attended became a medium size company (Interviewee 20).

One of the projects they were running in Guatemala in 2017 was "ENTRE TODOS". Groups of people that save and periodically contribute a quantity of money to the group to form a common fund that will give loans among their own members. Given that most of the population is illiterate, the primary objective of the project was to help these groups improve their financial skills to understand the fundamentals of how cooperatives work, as well as gaining a basic knowledge of budgeting and operational control. This allows them to generate profits for themselves and have access to liquidity to cover their basic survival needs, as well as enable members to access micro-loans for investment provided by the group (Interviewee 20 and 21).

2.4.3.3 Fundación AFI, Madrid

Fundación AFI is a NPO created by Analistas Financieros Internacionales (AFI) in 1999. Its mission is to promote financial education, innovation and inclusion in Spain and developing countries.

In 2014 AFI published a very interesting book with Fundación Telefónica called *"Microfinanzas y TIC. Experiencias Innovadoras en Latinoamérica* that cover the future challenges of MFIs and TICs"* (Ontiveros et al., 2014) (Interviewee 22).

2.4.3.4 Inversión and Cooperación" (I and C)

"Inversión and Cooperación" (I and C), is a private foundation born from a Spanish family business group, Expert Timing Systems (ETS) specialized in financial advisory and TechRules [4] a financial technology company.

"It is our goal since the beginning to leverage on these 30 years expertise through our foundation to promote social inclusion through financial education and technology at the base of the pyramid "(Interviewee 23).

They believe that trust among families and friends are a commonly underestimated key human value on which strong self-sustainable cooperation projects can be developed. However, most cooperation projects today fail to respect this critical principle of respect, thus harming sustainability self-sufficient persons, families, communities, and countries. Lending money without previous education and savings habits or giving goods for free, generate dependency and bad habits.

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[4] *www.techrules.com*

I and C designed a program called "Saving for Learning" based on the community lending groups model with the purpose of starting a trend of self-sustainable improvement in the quality of life of families living in poverty (Interviewee 23).

"Educating to generate long-term saving habits and management skills is our challenge. We have designed a practical financial education program based on a safe flexible, transparent, inexpensive and profitable way to save, targeting groups of 10 to 50 people linked by strong bonds of trust. I and C applies a self-finance and self-managed socio-economic inclusion model which does not begin by external credit, but by promoting community savings. A solution based on four pillars: financial education, self-financing through savings, self-management and technology" (Interviewee 23).

I and C decided to apply new ICT technologies to make financial services more accessible, convenient, and safe and developed an advanced cloud-mobile technology. The main purpose of the platform was to help group members to manage their weekly meetings more efficiently (savings, paid-in capital, loans, interest received and due) and to improve financial education by new innovative cost-effective teaching methods. In addition, their Qmobile online platform is used to train group members and program coaches (Interviewee 24).

"The "Saving for Learning" program was implemented in Peru and Ecuador. Ecuador is the largest one with more than 400 savings groups and 9.000 members. All without the intervention of any credit officers. Managed by the groups themselves with the advice of our coaches. The main beneficiaries of these savings groups are vulnerable woman" (Interviewee 25).

2.4.3.5 Acción Emprendedora, Peru

"Acción Emprendedora" is a team of volunteer professionals committed to the development of Peru. Their mission is to transmit knowledge in business management to entrepreneurs by necessity, so that they have more opportunities of success. Their vision is to transform the lives of Peruvian micro-entrepreneurs through a business development program which links the best of their talent with the knowledge and experience of volunteer professionals. Entrepreneurs can access specialized training programs given by experience volunteers, they share their talent by joining the professional team of advisors, teachers and mentors (Interviewee 26).

2.4.4 Other institutions

2.4.4.1 ESAN University Peru

ESAN University has an important role in Higher Education and collaborates in several educational projects targeted to woman in rural areas like "Project Pro-Mujer". Pro-Mujer is

a women's development program with counselling sessions related to health, food and basic education. They use mobile clinics to reach clients and their families living in remote areas.

"We believe that if we help woman, it can transform the lives of their families that become healthier and more educated" (Interviewee 27).

Individuals are increasingly using mobile phones to access many different services, but half of the Peruvian population is still unable to take full advantage of the services potentially available. The Internet coverage in Peru rural areas has increased in the past few years thanks to the high investment and government support but still do not cover de 100 per cent of rural territories.

"I believe that ICTs will help improving financial inclusion with less expensive financial services. ICT´s revolution will help rural population accessing education, public services and digital payments" (Interviewee 28).

The university is also involved in entrepreneurship programs delivered by university students as part of their social responsibility program (Interviewee 29).

2.5 Findings Discussion, Recommendations and Conclusions

2.5.1 Findings discussion

The main findings from these interviews with local MFIs and other microfinance institutions making a traceability of each result with the issues arisen in the interviews which are the following:

Firstly, they all agree that MFIs relational model is very expensive given the number and size of loans, and that many customers live in remote rural areas. Banking agents or front-line officers are the sales force, the revenue generators and the MFI's interface with clients, therefore training and retaining them should a priority (Interviewees 1, 4, 5, 9, 10 and 11).

Secondly, the low customers retention rate reported by FC, only 20 per cent of their customers remain with the MFI for more than 2 years (Interviewees 1, 4, 5 and 6). Clarity of the underlying factors of drop out is essential in other to re-address the MFI efforts in terms of customer experience, product flexibility, financial education and so on. Some of the reasons for drop out are health problems, business failure, group problems and that banking officials move to another MFI and take their customers with them (Burgon et .al, 2012). Given that client contact relies heavily on the banking agents, retention and training programmes of these agents are vital.

Thirdly, intense competition in Peru is causing over-indebtedness and a high customer rotation (Interviewees 1, 4, 11 and 16). A 2010 report carried out by the Centre of Microfinance at the University of Zurich, highlighted the risk of over-indebtedness in Peru in line with Kappel, Krauss and Lontzek (2010) and McIntosh and Wydick (2005). In 2016,

Smart Campaign published a report on Peruvian consumers showing that rural consumers spend 35 per cent of their monthly income on debt repayment and 16 per cent are late on their payments.

Fourth, people in rural areas resist opening accounts because of the lack of trust in the financial system and other reasons. Becoming part of the financial system requires customers to change their habits and increase trust on institutions, which can take time (Interviewees 2, 8, 14 and 17).

Fifth, all interviewees agree that education is the only tool that can improve situations of vulnerability and improve the microcredit impact, in line with Kaiser and Menkhoff (2017) and Karlan and Valdivia (2011). Educational materials should cover the following issues: Differentiate family and business accounts, how to use saving accounts, improving trust in financial institutions, basic accounting (recording transactions, cash-flows, and budgeting process) and selling and marketing (Interviewees 12 and 13).

In addition, training methodology should be adapted to local cultures and be provided at relevant moments, for example with credit. Given that front-line officers work with customers, helping them to produce pro-forma financial statements and complete the credit application form, is an excellent moment to train them in accounting and financial products (Interviewee 5 and 8). Another interesting finding is that most MFI´s had developed different types of training programmes with high involvement of university students and lecturers, this is a way to bridge the gap between Higher Education Institutions and the real world in line with Yunus (2003).

If training is well designed, it will have a positive impact (Fiala, 2018; Masino and Niño-Zarazúa, 2016; Drexler et al., 2014). Its primary role is to provide essential information on financial products and how to manage cash-flow (Interviewees 1, 4, 10, 12, 14, 20, 23, 26, 27 and 29).

The interviewees pointed out that governments should be responsible for providing an appropriate institutional framework (Interviewees 12, 14 and 22) in line with Acemoglu and Robinson (2012). Trust in the institutions, regulatory environment, modern infrastructure, and communications, are among the conditions that play a key role in improving financial inclusion. Corporate governance is another important issue (Interviewee 17). MFIs must consider whether the whole organisation is achieving their mission efficiently and sustainably (Gutierrez-Goiria et al., 2017). Government and banking institutions should work together to increase digital financial inclusion within an appropriate framework. A good example of cooperation is the *"Billetera Móvil" (BIM)* project (Interviewees12, 14 and 15) a digital payment product that has recently been launched in Peru. They aim to improve the use of digital and mobile technologies as a tool to increase financial inclusion.

One recent example of public-private collaboration in Latin-American is the Locfund Next: the first permanent regional vehicle, managed by local managers, dedicated to

providing local funding and digital transformation support to MFIs. Google funded $8 million through the Inter-American Development Bank's Innovation Lab (IDB Lab) that additionally provided $4.5 million. This increases the capital available for SMEs to access formal microcredit and, as a result, strengthen their economic recovery and accelerate the post-COVID-19 economic recovery process (IDB Lab News, 2021).

2.5.2 Recommendations

Based on the interviews, results discussion, research reports and fieldwork in Peru, we define some broad recommendations in relation to financial inclusive products and financial education programmes. We will differentiate our target population by the level of poverty: extreme poverty (less than US$1.9 a day), poor population (less than US$3 a day) and vulnerable (between US$3 and US$10 a day) (Interviewees 12 and 13). Each group will receive a different type of education.

Traditional financial education can impact some financial behaviours, but it is very expensive and not very effective (Kaiser and Menkhoff, 2017). The impact of training programmes improves when tuition is adapted to the micro-entrepreneur's needs (Bali and Varghese, 2013). However, the cost of providing individual financial education can be prohibitively high. In addition, it is difficult to persuade many people to attend these programmes. Therefore, it is necessary to design cost-effective training programmes using ICTs (Interviewees 11,15, 22, 23, 24 and 28), (Ontiveros et al., 2014; Kauffman, and Riggins, 2012).

Our first recommendation is to establish differentiated strategies for different levels of poverty (Interviewees 8 and 9). Depending on the level of poverty, different approaches in terms of products and financial and accounting education should be offered in order to optimise financial inclusion. In addition, education programmes should be simple and attractive, personalised to individual needs, and, ideally, in line with their specific financial decisions. Table 2.1 shows the type of education that should be offered depending on the level of poverty.

Table 2.1 Financial inclusive Education per level of poverty

Education Program	Extremely Poor	Poor	Vulnerable
Basic training on skills	✓		
Introduction to financial products		✓	✓
Basic accounting and financial education			✓

Source: Author's own

If we really want to increase the impact of microfinance, the government, NPOs and

MFIs should take different approaches depending on the target population's level of poverty. Different financial products should be offered depending on the customer's needs and profile. For example, CCT programmes and primary education is the responsibility of the government and should cover all the extremely poor population, for example "Programa CUNA and JUNTOS" Peru. Group financing credit with education, particularly for women living in rural areas are very interesting training programs provided by NPO and MFI´s. This specific education programme should be designed and delivered weekly or monthly when the instalments are paid. Finally, MFIs should focus on the more promising and sustainable 'upper micro' that have better chances to create jobs and survive. In this segment of the population individual's loans and savings accounts should be offered together with financial education and basic accounting. The focus group will be micro-entrepreneurs and the training should coincide with their financial decisions (Table 2.2).

Table 2.2 Financial inclusive products per level of poverty

Product	Extremely Poor	Poor	Vulnerable
CCT "Programa Juntos"	✓		
Saving groups programs	✓	✓	✓
Open an account or mobile accounts		✓	✓
Saving Accounts		✓	✓
Credit with education	✓	✓	✓
Digital Payments		✓	✓
Individual microcredit			✓
SME Loan			✓

Source: Author's own

2.5.3 Conclusions

Financial exclusion is both a result and an obstacle to the development of the poorest populations and their communities but opening a bank account or accessing to finance through MFIs is only part of the challenge. Without the necessary financial skills, it is impossible for micro-entrepreneurs to manage their loans, make correct decisions and ensure their businesses grow in a sustainable way. It is often assumed that account ownership is the mayor cause of financial inclusion, but our analysis shows that it is the correct use of financial products what makes the difference in improving the lives of the more vulnerable. Some of the ways to increase financial inclusion is to improve the level of financial education, to increase trust in financial institutions and to encourage the use of mobile banking.

We have selected different MFIs in Peru and other microfinance stakeholders (associations, foundations, NPOs and customers), which are essential to cover the different points of view from the more institutional to the micro beneficiaries of microfinance institutions.

Financial inclusion and the quality of education in many of Latin America countries are still very low in comparison with developed countries. The lack of financial and accounting skills is one of the main problems for micro-entrepreneurs when managing their micro-business. It has been proven that financial education improves micro-credit beneficiaries' financial outcomes and is a critical issue to fully achieve financial inclusion (Drexler, Fischer and Schoar, 2014; de Mel, McKenzie and Woodruff, 2014; Karlan and Valdivia, 2011).

The impact of training programmes improves when tuition is adapted to the micro-entrepreneur's needs (Bali and Varghese, 2013). When and how training is provided is even more important than the content. More dynamic, innovative and cost-effective training methods should be developed. MFIs front line offices are a key figure in the microfinance process and should have the appropriate training in order to retain and add value to customers. Finally, we are currently experiencing a profound digital revolution, characterised by unstoppable technological advances. This digital expansion also affects microfinance, which has been strongly driven by the rapid adoption of mobile communications and the development of new ICT solutions. Innovative and less expensive financial training programmes must be designed using ICTs technological advances (podcast, educational videos), in line with Gutierrez-Nieto and Serrano-Cinca (2019). In addition, it will be possible to access and train the most vulnerable population in remote areas at a lower cost through mobile phones. QMobile platform developed by I and C is a good example of how technology can improve savings groups outcomes. There are a variety of implementations for MFI, to extent financial and accounting education according to the level of poverty; they should invest on banking agent's education and digital tools. In addition, if the level of accounting education improves, loan default will decrease improving MFI performance and sustainability.

Mobile money accounts will also help reducing cash payments. New interbank payment models are expanding throughout Latin America with the goal of making money transfers between individuals and businesses faster, easier and always available using electronic devices, especially smartphones. Some examples of mobile money are: the BIM project in Peru, the instant payment system, PIX in Brazil and the Mexico's CoDi electronic transfers that went live in early 2019. Banks and regulators have been working on these projects for months, but it is now, with COVID-19, when these projects have taken on great urgency.

Undeniably there is a close relationship between economic development and financial inclusion, however, recent research suggests that having an account does not necessarily imply better financial health. Financial inclusion must be measured not only by access to financial products but, more importantly, by their quality and use. Digital inclusion should

cover a robust Internet access, affordable devices, financial literacy and finally, appropriate contents and applications.

We can say that the microfinance sector is under a great pressure, but the Pandemic represents a unique opportunity to invest in digital inclusion in Latin American. Digital technologies will play an important role in accelerating the economic recovery of the most vulnerable population. This can only be accomplished if governments and private sector work together to help the unbanked reduce their digital breach.

As contributions of the chapter, we could classify then in contributions for practitioners, academics and development institutions. For practitioners, the use ICTs must be further incorporated in their daily contacts with the beneficiaries from the initial stages of risk evaluation to the management of the monthly meetings were training on-line should be promoted, and more important for the impact assessment. As an example of good practices are FMBBVA and I and C. For academics, new qualitative research practices have been proposed with a technical sheet and a semi-structured questionnaire together with new training approaches for the different types of poverty groups. For the international development institutions, we suggest that all the actors involved such as government, NPOs and MFIs should work together to provide the necessary framework for increasing stability and integrity of financial institutions, promote the use of new technologies for financial inclusion and education, and finally provide protection of the more vulnerable. Cooperation among the different actors is the only way to achieve economic growth in a sustainable and inclusive way.

Our study has several limitations. First, the generalizability of our findings is restricted by our focus on Peru. These results should, of course, be interpreted with caution, as they may be idiosyncratic of the period and region. A second potential limitation is that the information gathered through interviews was at one point in time, whereas the technology and MFIs evolution is a dynamic process. Finally, we have focused on financial education and ICT but there are other factors that can affect MFIs' impact on the more vulnerable. The data we present in this report dates before the pandemic, so it does not account for COVID-19 potential impacts. The pandemic especially affects developing countries with weaken public health and low education. One of the four transformation lines suggested by SDG is Education, Gender, and Technology. COVID-19 crisis has accelerated the use of digital tools and remote education. Countries should continue investing in these areas.

These results legitimize the authors to continue exploring on this area. There is a need for more research that can assist both lenders and borrowers achieve jointly economic growth in a sustainable and inclusive way. Future research lines include the design and implementation of financial and accounting training materials using ICT´s.

In the face of all the actual uncertainties, the priority for countries should be to ensure adequate resourcing of health systems, including vaccination and testing. The second is to

continue to support the vulnerable sectors most affected by the pandemic and to consolidate the recovery that is so far uncertain.

References

Acción Emprendedora, Peru. www.accionemprendedora.org.pe.

Acemoglu, D. and Robinson, J. (2012). *"Why Nations Fail: The origin of power. Prosperity and Poverty"*. Crown Business. New York.

Adventist Agency for Development and Assistance Resources (ADRA). https://adra-es.org/

Alliance for Financial Inclusion (2015). *"The 2015 AFI Global Policy Forum Report: Inspiring Innovation to Advance Inclusion"*. Alliance for Financial Inclusion https://www.afi-global.org/publications/the-2015-global-policy-forum-gpf-report-inspiring-innovation-to-advance-inclusion/.

Ammar, A. and Ahmed, EM (2016). "Factors influencing Sudanese microfinance intention to adopt mobile banking". *Cogent Business and Management V.3,1154257.*

Asociación de Bancos de Peru (ASBANC). https://www.asbanc.com.pe/

ASOMIF (2019). Asociación de Instituciones de Microfinanzas de Peru. http://www.asomifperu.com/web/.

Bali, S.R. and Varghese A. (2013). "Delivery mechanisms and impact of microfinance training in Indian self-help groups". *Journal of International Development, V.25, 11-21.*

Bateman, M. and Chang, H. (2009). "The microfinance illusion*". SSRN Electronic Journal, DOI: 10.2139/ssrn.2385174.*

Bibi, U., Balli, H. O., Matthews, C. D. and Tripe, D. W. L. (2018). "New approaches to measure the social performance of microfinance institutions". *International Review of Economics and Finance, V.53, 88-97.*

Biderbost Moyano, P. and Jiménez J. (2016). "Experiences of impact assessment in development aid in Latin America". *Miscelanea Comillas, V.74(144), 35-63.*

Blattman, C. and Ralston, L. (2015). "Generating Employment in Poor and Fragile States: Evidence from Labor Market and Entrepreneurship Programs*". Available at SRRN https://ssrn.com/abstract=2622220.*

Burgon, A., Gray, B. and Gash, M. (2012). "Deconstructing Drop-Out. Uncovering the reasons behind attrition among village banking microfinances clients". *https://www.centerforfinancialinclusion.org/deconstructing-drop-out.*

CEFI (2020). Centro de Estudios Financieros (CEFI) de la Asociación de Bancos de Peru. www.cefi.edu.pe/.

Chen, H. (2017). "Peruvian Microfifinance: Mergers and Acquisitions and Industry Outlook". *Perspectives on Business and Economics, V 35/7. Lehigh Preserve Institutional Repository https://preserve.lehigh.edu/perspectives-v35/7.*

CODESPA. www.codespa.org.

COPEME. https://www.copeme.org.pe/.

Cull, R., Demirgüc-Kunt, A. and Morduch J. (2018). "The Microfinance Business model: Enduring Subsidy and Modest Profit". *The World Bank economic Review, V.32(2), 221-224.*

D´Espallier, B., Geodecke J., Hudon,M. and Mersland, R. (2017). "From NGOs to banks: Does institutional transformation alter the business model of microfinance institutions?". *World Development,, V.89, 19-33.*

De Mel, S., Mckenzie, D. and Woodruff, C. (2014). "Business training and female enterprise start-up, growth, and dynamics: Experimental evidence from Sri Lanka". *Journal of Development Economics, V.6, 199-210.*

Deb, A. and Kubzansky, M. (2012). *"Bridging the Gap: The Business Case for financial capability".* Citi Foundation and GIIN.

Demirgüc-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J. (2018). *"The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution".* The World Bank. https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1259-0.

Drexler, A., Fischer, G., and Schoar, A. (2014). "Keeping it simple: financial literacy and rules of thumb". *American Economic Journal: Applied Economics, V.6(2), 1-31.*

El Peruano (2021). Ley 31120 que regula la cuenta Documento Nacional de Identidad. https://busquedas.elperuano.pe/normaslegales/ley-que-regula-la-cuenta-documento-nacional-de-identidad-cu-ley-n-31120-1926089-1/.

Fernandes, D., Lynch Jr, J.G., and Netemeyer, R.G. (2014). "Financial literacy, financial education, and downstream financial behaviours". *Management Science, V.60(8), 1861-2109.*

Financiera Confianza. https://confianza.pe/.

Fiala, M. (2018). "Returns to microcredit. Cash grants and training for male and female entrepreneurs in Uganda". *World Development, V.105, 189-200.*

FMBBVA (2019). "Social Performance Report 2018". http://www.fundacionmicrofinanzasbbva.org/en/informes/2018/

Freedom from Hunger (FFH) https://www.freedomfromhunger.org/

Fundación AFi (2021). https://www.fundacionafi.org/.

Garcia, A. and Lensink, R. (2019). *"Microfinance-Plus: a review and avenues for research".* Colection Economics 2019, Chapter 9, 111–124.

Global Entrepreneurship Monitor (GEM) 2018/2019. "*Global Report".* https://www.gemconsortium.org/report/gem-2018-2019-global-report.

Global Findex (2017). *"Measuring Financial Inclusion around the World",* https://microdata.worldbank.org/index.php/catalog/global-findex/about.

Global Microscope for financial inclusion (2019). *"Global Microscope 2019: The enabling environment for financial inclusion".* The Economist Intelligence Unit. http://www.eiu.com/Handlers/WhitepaperHandler.ashx?fi=EIU_Global_Microscope_2019.pdf&mode=wp&campaignid=microscope2019.

Grameen Bank. www.grameen.com.

Gutierrez-Goiria, J., San Jose, L. and Retolaza, J.L. (2017). "Social Efficiency in Microfinance institutions: Identifying how to improve it". *Journal of International Development, V.29, 259-280.*

Gutierrez-Nieto, B. and Serrano-Cinca, C. (2019). "20 years of research in microfinance: An information management approach". *International Journal of Information Management. V.43, 183-197.*

Hermes, N. and Lensink, R. (2011). "Microfinances: Its Impact, Outreach and sustainability". *World Development, V.39 (6) 875-881.*

Hulme, D. and Mosley, P. (1996). *"Finance against Poverty".* (Vol1). Routledge, London.

I and C (2020). Fundación Inversion y Cooperación.
https://www.fundacionseres.org/Paginas/Campus/Empresa.aspx?ido=898

IDB Lab News (2021). "IDB and Google Partner to Strengthen Small Businesses in Latin America and the Caribbean". https://bidlab.org/en/news.

Kaiser, T., and Menkhoff, L. (2017). "Does Financial Education Impact Financial Literacy and Financial Behaviour, and If so, When?". *World Bank Policy Research Working Papers WPS8161.*

Kappel, V.; Krauss, A. and Lontzek, L. (2010). "Over-Indebtedness and Microfinance– Constructing an Early Warning Index*". Working Paper, Center for Microfinance, University of Zurich.*

Karlan, D. and Valdivia, M. (2011). "Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions". *The Review of Economics and Statistics, V.93 (2), 510-527.*

Karnani, A. (2006). "Fortune at the Bottom of the Pyramid". *WP 1035. Michigan Ross School of Business.*

Karnani, A. (2007). "Employment, not microcredit, is the solution*". WP 1065. Michigan Ross School of Business.*

Lacalle Calderón, M., and Rico Garrido, S. (2007). "Evaluación del impacto de los programas de microcréditos: Una introducción a las metodologías científicas de evaluación de impacto". *Cuaderno Monográfico, 9 Foro Nantikl Lum de Microfinanzas, Madrid.*

Leatherman, S., Metcalfe, M., Geissler, K. and Dunford, C. (2011). "Integrating microfinance and health strategies: Examining the evidence to inform policy and practice". *Health Policy and Planning, V.27(2), 85-101.*

Mastercard (2020). *"The acceleration of financial inclusion during COVID-19 pandemic. Bringing hidden opportunities to light".* https://newsroom.mastercard.com/latin-america/files/2020/10/Mastercard_Financial_Inclusion_during_COVID_whitepaper_EX TERNAL_20201012.pdf

Masino, S. and Niño-Zarazúa (2016). "What works to improve the quality of student learning in developing countries? International". *Journal of Educational Development, V.48, 53-65.*

McIntosh, C. and Wydick, B. (2005). "Competition and Microfinance". *Journal of Development Economics, V.78 (2), 271-298.*

McKenzie, D and Woodruff, C. (2014) "What are we learning from Business training and Entrepreneurship Evaluations around the developing world?". *World Bank Research Observer, V.29 (1) 48-42.*

MiBanco, MFI Peru. https://www.mibanco.com.pe/.

Microfinance Barometer (2018). http://www.convergences.org/wp-content/uploads/2018/09/BMF_2018_EN_VFINALE.pdf.

Morduch, J. (2017). *"Microfinance as a credit card".* Limn, Issue 9, Little development devices/Humanitarian goods.

Ontiveros, E, Martín Enriquez, A and Lopez Sabater, V. (2014). *"Microfinanzas y TIC. Experiencias Innovadoras en Latinoamérica".* Fundación Telefónica and Analistas Financieros Internacionales (AFI).

Pollin, R. and Feffer, J. (2007). *"Microcredit: False Hopes and Real Possibilities. Is microcredit the solution to global poverty? Yes and no...".* Foreign policy in Focus. Retrived from. https://fpif.org/microcredit_false_hopes_and_real_possibilities/.

Prahalad, C.K., and Hammond. A. (2002). "Serving the world's poor profitably". *Harvard Business Review Sept 02, RO2095.*

Rautiainen, A.; Urquía-Grande, E. and Muñoz-Colomina, C. (2017). "Institutional Logics in Police Performance Indicator Development: A Comparative Case Study of Spain and Finland". *European Accounting Review, V.26 (2), 165-191.*

Rodrik, D., Subramanian, A., and Trebbi, F. (2004). "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development". *Journal of Economic Growth, V.9(2), 131-165.*

Sen, G.and De, S. (2018). "How Much Does Having a Bank Account Help the Poor?". *The Journal of Development Studies, V.54 (9), 1551-1571.*

Superintendencia de Bancos y Seguros (SBS). www.sbs.gob.pe/

Tang, N. and LaChance, M. E. (2012). "Financial Advice: What About Low-Income Consumers?". *Journal of Personal Finance, V.11(2), 121-158.*

Taylor, S. and Bodgan, R. (1984). *"Introduction to quantitative methods. The search of meanings".* Wiley and Son ltd. New York.

United Nation Development Program (UNDP). https://www.un.org/ruleoflaw/un-and-the-rule-of-law/united-nations-development-programme-2/.

United Nations (UN) 2030 Global Agenda. http://www.undp.org/content/gcp/en/home/2030agenda/.

Vaivio, J and Sirén, A. (2010). "Insights into Method Triangulation and "Paradigms" in Interpretive Management Accounting Research". *Management Accounting Research, V.21(2), 130-141.*

Van Rooyen, C., Stewart, R., and De Wet, T. (2012) "The impact of microfinance in Sub-Saharan Africa: a systematic review of evidence". *World Development, V.40, 2249-2262.*

Vor der Bruegge, E. Dickey. JE. And Dunford, C. (1999). "Cost of Education in the Freedom from Hunger Version of Credit with Education Implementation. *Freedom from Hunger Research Paper No. 6, FFH, Davis, CA.*

World Bank (2019) (WB) https://data.worldbank.org/.

Yong, S. (2019) "Pride and Pejuice: Accounting and Polynesian entrepreneurs". *Pacific and Accounting Review. V.31(2), 182-207.*

Yunus, M. (2003) *"Banker to the Poor Micro-Lending and the Battle Against World Poverty".* Perseus Books LLC.

3

Chapter 3. The importance of accounting for micro-credit beneficiaries in developing countries: A social experiment in Spanish universities[5]

Abstract

Although real progress has been made improving the financial inclusion of the most vulnerable, there is still a long way to go if we observe the levels of success in managing financial products. This research is an attempt to raise awareness of the importance of financial and accounting literacy in financial inclusion and how it can be enhanced in the digital age. Firstly, our research has analysed different financial education programmes recently delivered by microfinance institutions. Secondly, the authors have designed a basic accounting tool that has been tested in three Spanish universities. Our findings show that participants in the intervention group performed better, proving that the accounting tool helped them record transactions and enhanced the usefulness of financial and accounting information. In addition, participants were highly motivated by the experiment, given the social purpose of our project, and helped them to understand better the situation in developing countries and the importance of accounting.

Keywords: financial education, accounting training, microfinance, developing countries and experiments in social sciences.

3.1 Introduction

Financial inclusion has been broadly recognized as critical in alleviating poverty and achieving inclusive economic growth. Undeniably, there is a close relationship between economic development and financial inclusion (Deb and Kubzansky, 2012). Several studies show that access to financial products allows people to start or expand new businesses, increase education and improve their living standards (Armendáriz and Morduch, 2010; Leatherman et al., 2011). The benefits of financial inclusion go beyond individuals; it can reduce income inequality and may also help to accelerate economic growth in a sustainable way (Banerjee and Duflo, 2007; Xu and Zia, 2012). Access to financial services is present in at least 5 of the 17 Sustainable Development Goals (SDGs) set by the United Nations 2030 Agenda for Sustainable Growth (UN, n.d.).

Real progress has been made in expanding financial inclusion. The Global Findex (Demirguc-Kunt et al., 2018) showed that between 2011 and 2017 the number of people worldwide with a bank account grew by 1.2 billion. However, 1.7 billion adults (31 per cent of the global adult population), most of whom are women, remain unbanked. In 2017, the number of women reporting having at least one financial product with a formal institution continued to be lower than that of men. Although account ownership continues to grow, inequalities persist. While 72 per cent of men have an account, only 65 per cent of women do (Demirguc-Kunt et al., 2018). Nevertheless, effective inclusion must be measured not only by access to financial products but, more importantly, by the use and quality of the products and services. Karlan et al. (2014) suggest five types of reasons why the poor do not effectively use financial products: financial illiteracy, transaction costs, lack of trust in banks, social constraints, and regulatory barriers.

Although much economic and financial literature has highlighted the importance of the microfinance industry as a key factor for financial inclusion (Maity, 2019), there is an intense debate about its real effectiveness as a development tool (Mader, 2017). Recent research (e.g. Karlan and Valdivia, 2011; De Mel et al., 2014) suggests that the low effectiveness could be related to the low level of financial education that is driving over-indebtedness among microfinance customers. All of this is affecting the industry's sustainability and social impact (Schicks, 2013 and 2014). Many authors have studied the impact of different microfinance programmes implemented with compulsory training in business skills (Karlan and Valdivia, 2011; McIntosh et al., 2011; Gubhert and Roubaud, 2011; Berge et al., 2012; Bali and Varghese, 2013; Verrest, 2013; De Mel et al., 2014). All these studies conclude that financial education helps improve financial outcomes. Additionally, a study carried out in Ghana also showed that financial literacy is key in promoting domestic savings (Baidoo et al., 2018). Also, Kaiser and Menkhoff (2017) highlighted the strong links between financial and accounting literacy and success in managing microcredits. In summary, there is a growing awareness of the need to promote changes in the level of financial literacy of individuals and households to improve their understanding of financial products and risks.

Additionally, new technologies can improve financial inclusion with less expensive financial services models (Ontiveros et al., 2014). The poorest in rural areas can benefit from

more accessible and efficient financial services, such as branch-less banking models, mobile payments and e-training even with simple text-based phones. GSMA (2019) estimates that only 40 per cent in developing countries have access to the Internet. Seven out of ten homes belonging to the poorest 20 per cent of the population have a mobile phone. These numbers can change, and India is a good example. India's Aadhaar programme and other government initiatives such as the rural broadband growth at a low cost have contributed to the increase in internet users and have allowed banks to open accounts for the most vulnerable population. The Kantar IMRB (2018) found that mobile phones are the main device used to access the Internet and that 87 per cent are regular users.

Hence, the main aim of this chapter is to find the answer to the following research questions:

RQ 3.1 How can financial and accounting literacy be boosted in the digital age?

RQ 3.2 It is possible and useful to improve financial and accounting education by using an accounting ICT tool?

Thus, this chapter includes in the first part a bibliographic review and contextualization of financial inclusion, and financial education. In the second part, we review different financial education programmes recently delivered by microfinance institutions. Thirdly, the authors designed a basic cash-flow template (Annex 3.2) to be used by micro-entrepreneurs in developing countries. This cash-flow template has been tested with undergraduate business students of three Spanish universities using a controlled experiment between groups (intervention and control). A section on methodology, sample, and instrument follows.

In the section on our findings, we show that participants performed better in the intervention group, proving that the cash-flow template helped them record transactions and enhanced the usefulness of financial and accounting information. In addition, they were highly motivated by the experiment, given the social purpose of the project and enjoyed working on the case that helped them understand the importance of accounting.

3.2 State of the art

3.2.1 Financial education

The strong link between financial and accounting literacy and the success in managing savings and microcredits has attracted considerable attention from researchers and practitioners in the field of cooperation programmes. Citi Foundation (2011) suggests that currently, most micro borrowers do not have the necessary skills to properly use their loan proceeds and many of them just use the microcredit for basic consumption needs. Sen and De (2018) point out that only a few numbers of credit beneficiaries had received any sort of financial training. The lack of financial skills is one of the main problems for micro-entrepreneurs when managing a micro-business. Basic accounting is essential, as it provides

information on which to base decisions, and to plan, forecast, and control (Tang and LaChance, 2012). Alliance for Financial Inclusion (AFI) managed to put together policy makers and regulators from 96 countries under the G20 event (Gabor and Brooks, 2016) with the purpose of creating a new framework of regulation, to integrate consumer protection and financial literacy (AFI, 2015). Risal (2018) recommends that new policies, strategies, and regulatory frameworks should be applied to microfinance institutions (MFIs) regarding the level of tolerance of indebtedness of their credit beneficiaries.

As mentioned, recent research shows that financial education is a key element for increasing financial inclusion. Even in developed economies, the level of financial literacy has a major impact on financial stability (Kaiser and Menkhoff, 2017; Lusardi and Mitchell, 2014). In addition, financial education helps the population acquire the necessary competencies to make informed and appropriate decisions, as well as enabling them to defend their rights as financial consumers (OECD, 2019). Moreover, financially literate citizens have a greater capacity to understand economic and social policies adopted within their economies (Fernandes et al., 2014). Therefore, financial educational in poor households should be considered a key investment because it carries the potential of lifting them out of poverty (Sen and De, 2018).

Researchers agree that the impact of training programmes improves when tutoring is adapted to the needs of micro-entrepreneurs. Variables such as whether the trainer was local or foreign, or if training was voluntary or linked to the credit could also impact the level of success of financial education (De Mel et al., 2014; Karlan and Valdivia, 2011). Bali and Varghese (2013) examined several variables and discovered that infrastructure, distance to the village, and communication problems had the greatest influence on training success. Mandell and Schmid Klein (2007) analysed motivation in financial literacy and found that personal motivation significantly increases financial skills. Hilgert et al. (2003) formed a Financial Practices Index based upon (self-benefiting) behaviour in cash-flow management, credit management, savings, and investment practices. They found a positive relation between the results of this index and scores on a financial literacy level suggesting that financial knowledge is related to financial practices. De Mel et al. (2014) conducted a random control trial that analysed the impact of business-training courses in conjunction with different types of financial lending. The training proved more effective for women starting up new businesses. The problem is that micro-entrepreneurs in developing countries rarely use management skills in accounting or inventory control to manage their business (Urquía-Grande and del Campo, 2017; McKenzie and Woodruff, 2014). Nevertheless, it is becoming more popular for MFIs to offer non-financial services such as training in business, technical, and social skills together with financial products.

In some countries, financial capability or financial literacy tends to be confused with entrepreneurship. They are different things but related: people are unlikely to be able to set up and run a business if they cannot manage their personal finances; but running a business also requires a separate set of knowledge and skills (Mundy, 2011), as many examples in both

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developed and developing countries of successful entrepreneurs with limited formal knowledge of 'financial literacy' prove.

Therefore, financial education must be identified as a priority by governments and the different institutions involved. Financial education, in a wide variety of forms, can help people to become more financially capable (Mundy, 2009). But raising financial education levels among the most vulnerable population is not easy, can be very expensive, and takes time. Coordination and long-term planning among the different actors are needed.

3.2.2 Financial education programs

Governments, financial institutions, and non-governmental organizations increasingly use financial education as a tool to boost financial inclusion. There are many different types of financial education programmes varying in duration and intensity, from a single hour-long session to weekly sessions over many months. In relation to curriculum, most of them cover a broad range of topics, from very basic concepts, such as differentiating between family and businesses accounts, loan use, profit and loss accounts, basic accountancy, and savings, to more sophisticated concepts, such as financial planning and commercial strategies. These programmes are mostly targeted to farmers or to women belonging to savings groups, while others are designed for a general audience or individuals. Several studies have shown that personalizing education to specific individuals' needs, or financial situations makes it more likely to impact their behaviour (Drexler et al., 2014; Freedom from Hunger, n.d.). These findings suggest that making financial training coincide with financial decisions will give participants less of a chance to forget what they learned. In terms of the delivered material, sometimes a simple cash-flow paper template is handled. Some relevant examples of financial education programmes recently provided by different MFIs and other organizations are given below.

Ujjivan Financial Services and Parinaam Foundation (India) developed customized programmes that consisted in showing a film which raises awareness of issues relating to over-borrowing and 'ghost lending' like Sankalp which means 'the resolution', that contains stories of 15 minutes available in multiple languages and are shown at diverse events, on cable TV shows, and at group meetings. In addition, the Parinaam Foundation offers a five week financial literacy programme named ¨Diksha" (Ujjivan Financial Services, 2019).

At the Institute for Indian Mother and Child microcredits are given in the form of group lending. Freedom from Hunger, an institution known for its training programmes in developing countries, designed the training material and delivery model together with the Indian Institute for Training and Development and the Indian Institute for Management. The programme is divided into five modules and delivered weekly for four months (Rusiná et al., 2015). The added value of this training programme is its complete range of homework that attendees have to complete and the development of a new business plan.

Relevant examples of accounting education are the programmes designed by the ILO (2015). They are mainly targeted to women and have a duration of three days. At the end of

each day, participants have to complete an evaluation form. They cover general topics such as over-indebtedness and default, services or how to prepare a budget. They use group discussions and interactive activities. At the end of the programme, participants are given a paper template to record and keep track of their family expenses.

FINCA (Foundation for International Community Assistance) offers financial services, such as small loans or savings accounts to people in remote communities using technology like mobile phones and tablets, and it also provides access to environmental solutions such as solar home systems and biomass kitchen stoves. Their programme's mission is to improve the socioeconomic situation of the poor and empower women through the promotion of village group lending. FINCA finances the client's working capital to help them grow their business. Additionally, FINCA provides tutoring in relation to savings, deposits, and interest rates. The organization's goals also include the clients' empowerment giving them the opportunity to participate on the rotating village-bank board (Karlan and Valdivia, 2011). Their training materials for teaching entrepreneurship contain general business skills and are adapted to the different locations.

For over a decade, Freedom from Hunger in cooperation with different MFIs all around the world have offered an integrated financial and education product, called Credit with Education, for the population at the bottom of the pyramid. Based on long experience working with MFIs, Freedom from Hunger has improved the methodology, developing technical modules to help local organizations to incorporate Credit with Education within their daily operations. The programme services focus on group lending for women because of their economic and domestic roles within the household. It also provides participants with small loans, and education in business management and other topics such as health and nutrition. Business education introduces concepts such as profit and loss, adding value, managing money, selling strategies, market evaluation, or inventory management. Evidence from Credit with Education programmes indicates that many of the desired impacts have been achieved (Freedom from Hunger, n.d.; Vor der Bruegge et al., 1999).

In the same line, *Microfinance-Plus* programmes are becoming more popular among MFIs. They also offer non-financial services (training in business, technical, and social skills) in addition to financial services (credit, savings, insurance, transfer, and payments). In this line, Garcia and Lensink (2019) analysed a sample of 478 MFIs in 77 countries. Twenty-five per cent of the MFIs offer business services together with microcredit to improve managerial processes (accounting, finance, marketing, etc.). However, micro-entrepreneurs in developing countries rarely use management skills such as accounting or inventory control (McKenzie and Woodruff, 2014).

Fundación Capital designed a tablet-based education application called 'LISTA App' that uses video modules, simulations, and games to teach financial skills and concepts to low-income women in developing countries. An evaluation of the impact of LISTA showed that beneficiaries who use the app were more likely to increase savings and increased their trust in banks (Fundación Capital, 2017). A successful example of using entertainment to deliver financial education comes from South Africa. A widely watched soap opera called *Scandal* is

used to provide financial education. It consisted of creating some chapters of this well-known TV series, where the actors were involved in financial troubles: borrowing excessively and gambling. The impacts on borrowing and gambling behaviour four months after the financial education messages were very positive. For example, those who watched *Scandal* were 69 per cent more likely to borrow through formal versus informal channels. In addition, after the programmes the number of calls to the financial information hotline increased dramatically (IPA, 2018).

Another experiment carried out in western Uganda (Kaahwa et al., 2019) showed that the use of audio media technology (AMT) in the form of radio podcasts and audio CDs for financial literacy has a positive impact. The participant's knowledge of personal finances, saving, loan acquisition, and making payments significantly improved after attending the AMT training. Results also revealed that participants that listened to the radio broadcasts in groups obtained better results than their counterparts who listened individually.

3.2.3 Cash-flow template and case study

In line with Mandell and Schmid Klein (2007), personal motivation significantly increases financial skills and the results demonstrate that financial knowledge improves with financial practices. For this reason, the authors have developed a very practical training material, comprising a case study and an Excel template, to be used by micro-entrepreneurs with virtually no knowledge of accounting, just basic levels of literacy and numeracy. The case study (Annex 3.1) and the Excel template (Annex 3.2) can be used in the savings groups regular financial education training session, so micro-entrepreneurs can apply it when running their business.

The case study describes three months of transactions of a women entrepreneur in a rural area of Peru who has started an in-house business. Even though the activity is not designed specifically for women, the authors decided to use a woman character to encourage other women to become entrepreneurs. Also, it is a contribution to close the gender gap, following Amine and Staub (2009).

The purpose of the template (paper or electronic) is that while micro-entrepreneurs record transactions, they understand their business key aspects better (e.g., revenues, cost, capital expenditures, and financial needs). This information will allow them to create budgets that can be useful as a financial and accounting planning tool. The first lesson that the cash-flow template provides is the need to differentiate the transactions that affect the family from those that affect the business. In most cases this concept is not clear, and family transactions are mixed with business transactions. The second lesson obtained from this cash-flow template is the distinction between the different types of payment and collection transactions. Therefore, the template is divided in three blocks, regular income and expenses, extraordinary cost or capital expenditures, and financial resources. Finally, as the third lesson, the inventory template shows the relationship between purchases, cost of sales, initial inventories, and ending inventories. In addition, financial transactions are also provided as part of the template to help entrepreneurs to distinguish between the face value of debt, interest rates and

repayment schedule. The template is flexible and can be adapted to different kinds of industries.

In order to verify the effectiveness, the case study and the cash-flow template have been tested with students from three Spanish universities. The purpose of the experiment is multiple: firstly, to validate the usefulness of a cash-flow template in recording transactions; secondly, to emphasize the importance of separating business and family accounts to make the right decisions; and, thirdly, to raise awareness about the importance of digital tools to improve the level of financial and accounting knowledge.

3.3 Method, sample, and instrument

The sample comprised 233 students from three different universities in Madrid, two private and one public. All those students were enrolled in the second year of the Business Administration degree or double degrees with Law, International Relations or Marketing.

The students' sections have been randomly allocated to the experimental conditions (control and intervention groups) and they have been tested only once. The intervention group of students was given the cash-flow Excel template (Annex 3.2) developed by the authors, while the control group were just given general instructions to record the transactions without the Excel template. The variable of interest is the case study grade. Case study grade is the average value of the case study different questions. The grade was from 0 to 10 (see Annex 3.3).

The case study took place in the classroom during an accounting lecture at the end of the 2018–2019 academic year to ensure a reasonably high response rate. Previously, the instructor explained the objective of the research and the procedure. The parts of the case study and the questionnaire were explained, pointing out the importance of their collaboration but emphasizing that participation was voluntary, and that data would be anonymized and aggregated for publication purposes. The case study was completed on an entirely voluntary basis and students were informed that they could opt out at any moment. However, all students opted to take part. Filling out the case study and the questionnaire lasted in total less than two hours (one session).

The self-reported pen-and-paper questionnaire consisted of the following seven items:

1. Indicate which is your interest in starting a new business. (X1.ENTRE)
2. Do you find this exercise useful if you were planning to start a new business? (X2.USFL)
3. Do you come from an entrepreneurial family? (X3.ENTRFA)
4. Indicate the difficulty of this exercise (X4.DIFF)
5. Was the template useful? (Only in the intervention group)
6. Overall, did you understand the exercise? (X6.UNDERS)
7. How do you value your level of financial education? (X7.FINED)

All seven items were measured on a five-point Likert-type scale (from 1 = do not agree, to 5 = completely agree). There were also some items related to population characteristics and background such as age, gender, previous year's grade point average (GPA) or years of higher education already completed. There were only two qualitative variables: gender (118 men and 110 women in sample) and university (114 in UCM, 73 in UFV, and 46 in CUNEF). In the final sample five students with ages above or equal to 26 years were not considered, as their work and life experience would completely distort the results of the present study.

3.4 Findings

Regarding the analysed education programmes and the impact of different training programmes (RQ 3.1), we observe that the financial education must be simple, practical (learning by doing), personalized, and targeted to individuals not only village-groups. But delivering financial education to more vulnerable populations living in rural areas can be difficult and very expensive. Thanks to the digital revolution and the use of mobile devices such as mobile phones and tablets, new technology-based delivery channels can be implemented. Therefore, it is possible to design and deliver new financial education programmes that are more convenient to access and more entertaining. Concerning the tools that can be adjusted to facilitate the financial and accounting training in poor areas (RQ 3.2) the authors have designed a cash-flow template that has been tested with university students in Spain to adjust its possible extrapolation to micro-credit beneficiaries.

An overview of all quantitative variables included in the questionnaire is provided in Table 3.1. Mean age was 20.04 and median 20, with a positive skewness and kurtosis. Students' previous year GPA mean, and median were practically equal in 7 (out of 10) with a very small skewness and negative kurtosis, pointing to the expected normality of grades. Some students already have some work experience (mean value 5.3 months, and third quartile 7 months), with one student having been working already for 5 years (60 months), but the majority have no work experience (median 0 months). Most students are in their second year (median 2, third quartile 3), with some students up to their sixth year of higher education, as they might be doing a dual degree with law that takes longer to finish and where the business administration related classes are scheduled in later years. Finally, both the case study and the questionnaire took between one and two hours (variable Time spent in Table 3.1), with mean and median approximately one-and-a-half hours.

Table 3.1 Descriptive statistics

	Mean	St.Dv.	CV	Skewness	Kurtosis	Min	Q1	Median	Q3	Max
Age	20.04	1.29	0.06	1.44	1.85	18	19	20	21	25
GPA	7.05	1.01	0.14	0.08	−0.45	5	6.24	7	8	9.8
Case study grade	5.34	2.16	0.41	−0.03	−0.80	0.28	3.61	5.28	7	10
Years of HE	2.42	0.75	0.31	1.94	3.99	1	2	2	3	6
Work experience	5.32	9.73	1.83	2.65	8.15	0	0	0	7	60
Time spent	1.56	0.29	0.18	0.02	−0.16	1	1.5	1.5	1.5	2
X1.ENTRE	3.96	0.95	0.24	−1.09	1.18	1	4	4	5	5
X2.USFL	3.73	0.97	0.26	−0.69	0.24	1	3	4	4	5
X3.ENTRFA	2.95	1.32	0.45	−0.04	−1.01	1	2	3	4	5
X4.DIFF	3.05	0.87	0.29	0.22	−0.09	1	2	3	4	5
X6.UNDERS	4.25	0.75	0.17	−0.84	0.40	2	4	4	5	5
X7.FINED	3.59	0.76	0.21	−0.39	0.44	1	3	4	4	5

The variable of interest is the case study grade. The box plots for the case study grades of the control vs. the intervention groups are presented in Figure 3.1. The box plot for the intervention group is clearly higher than the one for the control group, with the first quartile of intervention only slightly smaller than the third quartile of control, suggesting a difference between both groups

Figure 3.1 Control and intervention group grades box plot
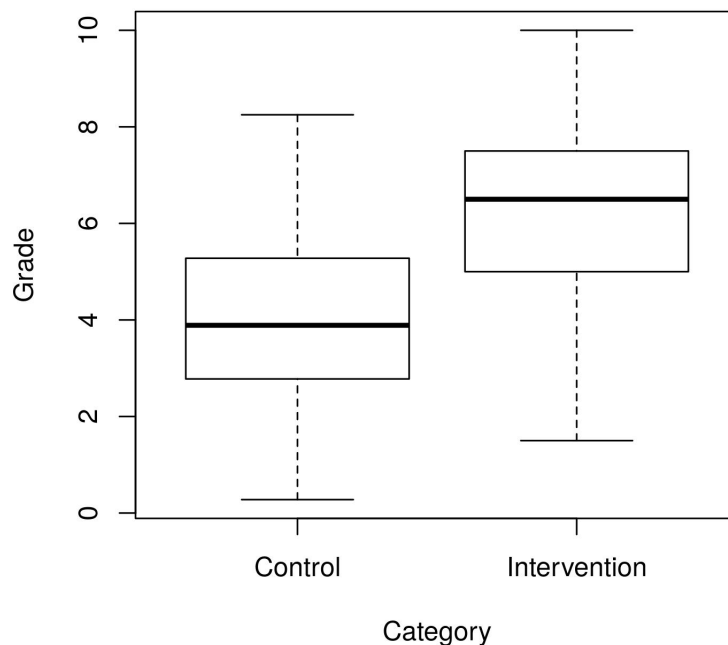
The overview of the case study grade descriptive statistics by allocated group (control vs. intervention) is presented in Table 3.2. As shown in the table, there is a great difference in their mean (4.05 vs. 6.3) and median (3.89 vs. 6.9) values, indicating, as the box plot also did, a more than probable effect of the intervention.

Table 3.2 Descriptive statistics for case study grade by group

	Mean	St.Dv.	CV	Skewness	Kurtosis	Min	Q1	Median	Q3	Max	n
Control	4.05	1.75	0.43	0.32	-0.24	0.27	2.78	3.89	5.28	8.25	97
Intervention	6.30	1.94	0.31	-0.43	-0.30	1.5	5	6.5	7.5	10	131

To test our hypothesis, the Shapiro-Wilk normality test was carried out to ensure the adequacy of the t-test. For control (W = 0.97674, p-value = 0.08244) p-value is greater than 0.05, while for the intervention group (W = 0.97226, p-value = 0.008721) p-value is lower than 0.05, leading us to conclude that the sample deviate from normality.

Wilcoxon rank sum test, also known as Mann-Whitney U test, is the non-parametric alternative to the independent t-test, and it is used when the data are ordinal or when the normality assumptions of the t-test are not met, as in our case. The *p*-value of the test is 6.583×10^{-15} ($U = 2517.5$), which is clearly less than the significance level alpha = 0.05. Hence, it can be concluded that the control's case study grade is significantly different from that of the intervention. Furthermore, we can conclude that the control's case study grade is significantly lower than that of the intervention ($U = 2517.5$, *p*-value = 3.292×10^{-15}).

Therefore, there is statistically significant evidence at α = 0.05 to show that the populations of grades are not equal in students belonging to the intervention group compared to students in the control group. Moreover, there is also statistically significant evidence at α = 0.05 to show that the populations of grades are higher in students belonging to the intervention group compared to students in the control group.

As mentioned above, students in the sample belonged to different universities in the region of Madrid (Spain), one state and two privately owned. Tuition fees for a bachelor's degree at a public university in Madrid are around €1,500 per year, while for the privately owned they can go up to €18,000 per year. Before proceeding further and in order to ensure the suitability of the sample, and verify that the cost, as a proxy for social extraction, was not influencing the results, a Wilcoxon rank sum test was run on the grades by university type, as the normality condition was not verified for the private students' grades (W = 0.98782, *p*-value = 0.3671). The results confirm there is no difference in grade by type of university (U = 6820.5, *p*-value = 0.5012).

Finally, a Wilcoxon rank sum test was run on the responses to the X2. USFL item (Do you find this exercise useful if you were planning to start a new business?) for both control vs. intervention, and university type. As shown in Table 3.3, there is no significant difference in the mean between control and intervention group for X2.USFL mean values (3.66 vs. 3.78) and their median coincide, indicating, as frequencies in Figure 3.2a also do, a not very probable effect of the intervention. However, Figure 3.2b shows quite different behaviour in the frequencies of the responses for the type of university, a fact that is also seen in their mean (3.99 vs 3.44) and median (4 vs. 3) differences.

Table 3.3 Descriptive statistics for X2. USFL by group and university type

	Mean	St.Dv.	CV	Skewness	Kurtosis	Min	Q1	Median	Q3	Max	n
Control	3.66	0.96	0.26	-0.51	-0.02	1	3	4	4	5	97
Intervention	3.78	0.98	0.26	-0.84	0.55	1	3	4	4	5	131
Private	3.99	0.89	0.22	-1.24	2.17	1	4	4	5	5	119
State	3.44	0.98	0.28	-0.26	-0.27	1	3	3	4	5	109

Figure 3.2 Bar plot for X2. USFL by university type (a) group (b)
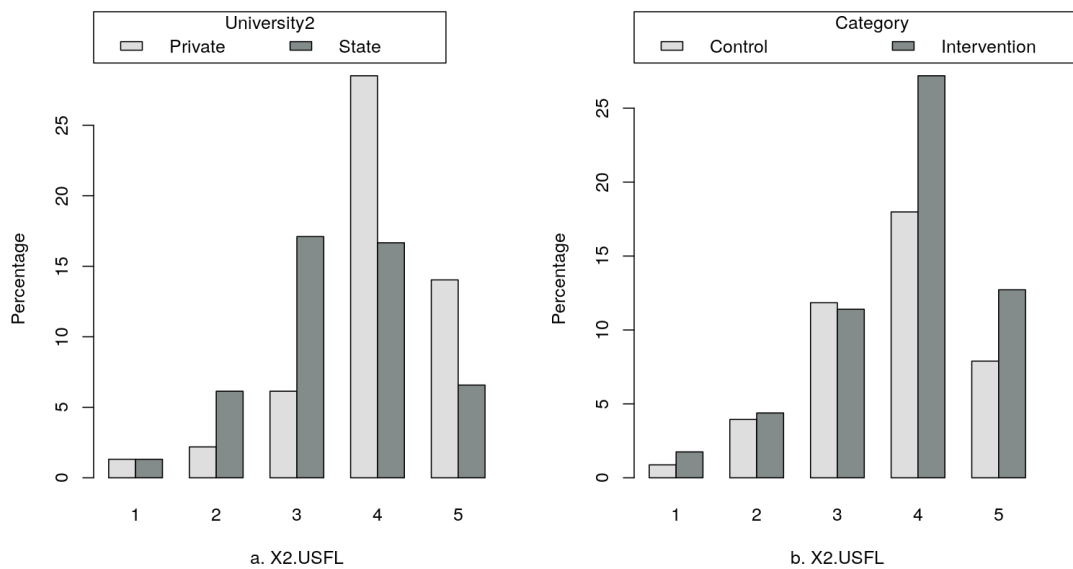
The results of the Wilcoxon rank sum test on the responses to the X2.USFL item indicate no difference in the responses for the intervention vs. control groups ($W = 5822$, p-value = 0.126), while there is statistical evidence to reject the equality of responses for the type of university ($W = 8688.5$, p-value = 0.000002559). Hence, there is statistically significant evidence at $\alpha = 0.05$ to show that the responses concerning the usefulness of the template are not equal in students belonging to a public university and students in a private one.

3.5 Conclusions

Financial inclusion remains a key political and social imperative. Although real progress has been made in increasing the number of bank accounts of the most vulnerable population, there is still a long way to go if we observe the levels of success in managing financial products. The lack of financial skills and basic accounting is one of the main problems for micro-entrepreneurs when managing a micro-business, in line with Tang and LaChance (2012). Recent evidence suggests that traditional financial education programmes have not been successful in improving financial knowledge or changing people's financial behaviour. Researchers agree that the impact improves when tutoring is adapted to the needs of micro-

entrepreneurs (Karlan and Valdivia, 2011; McIntosh et al., 2011; Gubhert and Roubaud, 2011; Berge et al., 2012; Bali and Varghese, 2013; Verrest, 2013; De Mel et al., 2014; IPA, 2018).

However, the access of populations living in rural areas can be difficult and very expensive. Thanks to the digital revolution and the use of mobile devices, new technology-based delivery channels can be implemented. Therefore, it is possible to design and deliver new financial education programmes that are more convenient to access, more entertaining and motivating.

One of the most important educational objectives is that microcredit beneficiaries should be able to record their daily transactions using an accounting cash-flow tool. For this reason, the authors have developed an Excel template that has been tested with business students of three different universities in Madrid, Spain. The intervention group was given the template while the control group were just given general instructions to record the transactions. Our findings show that participants performed better in the intervention group, showing that the cash-flow template helped them to record transactions and enhanced the usefulness of financial and accounting information. With the classroom experiment we have observed that the case study was very interesting and useful to the students. Also, the authors observed that the empathy of the tutor and the timing of the training affect the effectiveness of the case study.

Additionally, it is important to develop the appropriate contents, methodology, and settings to ensure learning, because each micro-entrepreneur requires a different teaching approach. To accomplish this, financial and accounting education must be integrated into daily activities and motivation to learn will be higher if training coincides with a financial decision, like setting up a new company or asking for a loan. In line with Mandell and Schmid Klein (2007), personal motivation significantly increases financial skills, and the results demonstrate that financial knowledge improves with financial practices. In addition, financial education should be entertaining. AMT will be an important medium for communicating with rural populations and educational audio or video sent to individual beneficiaries' devices will play an important role.

Our recommendation is that tutoring should be continuous, and loan beneficiaries should have access to training at any moment through mobile communication. Regarding the content of the financial education, it must be flexible depending on the specific needs of the beneficiaries. It should cover a wide range of basic concepts such as differentiating between family and business expenses, loan use, savings, financial planning and commercial strategies, and basic accounting, which is essential, as it provides information on which to base decisions to plan, forecast, and control.

No study is without limitations. First of all, our findings might be affected by the fact that the experiment was run on university students in a developed country. These results should, of course, be interpreted with caution considering that the final users are the financially excluded population in developing countries. A second potential limitation is that the cash-

flow template was designed for one type of business, although templates are flexible and can, therefore, easily be adapted to different kinds of industries. Finally, these templates should be delivered with educational support material (videos, audio).

These results, together with the exponential increase in smartphones and Internet access, legitimize the authors to continue exploring this area. Future research lines include the development of a flexible accounting app to be tested with microfinance beneficiaries in developing countries. We estimate that the results will be even better when used in developing countries as this accounting tool will allow them to classify transactions, helping them understand their business's key financial and accounting issues better.

References

Alliance for Financial Inclusion (2015). *"The 2015 AFI Global Policy Forum Report: Inspiring Innovation to Advance Inclusion"* Alliance for Financial Inclusion https://www.afi-global.org/sites/default/files/publications/gpf2015_report_aw_low_res.pdf.

Amine, L.S. and Staub, K.M. (2009). "Women entrepreneurs in sub-Saharan Africa: an institutional theory analysis from a social marketing point of view". *Entrepreneurship and Regional Development, V.21(2), 183-211.*

Armendáriz, B. and Morduch, J. (2010). *"The Economics of Microfinance"*. 2nd edn, MIT Press, Cambridge, MA.

Baidoo, S.T., Boateng, E., and Ampomsah, M. (2018). "Understanding the determinants of *saving in Ghana: does financial literacy matter?"*. *Journal of International Development, V.30(5): 886-903.*

Bali, S.R. and Varghese, A. (2013). "Delivery mechanisms and impact of microfinance training in Indian self-help groups". *Journal of International Development, V.25, 11-21.*

Banerjee, A and Duflo, E. (2007). "The economic lives of the poor". *Journal of Economic Perspectives, V.21: 141–67.*

Berge, L.I.O., Kjetil, B., Kartika, J., and Bertil, T. (2012). "Business training in Tanzania: from research driven experiment to local implementation". *Journal of African Economies V.21(5), 808-827 .*

Citi Foundation (2011.) https://www.citigroup.com/citi/foundation/.

De Mel, S., Mckenzie, D. and Woodruff, C. (2014). "Business training and female enterprise start-up, growth, and dynamics: experimental evidence from Sri Lanka". *Journal of Development Economics, V.106, 199-210.*

Deb, A. and Kubzansky, M. (2012). *"Bridging the Gap: The Business Case for Financial Capability"*. Monitor Group and Citi Foundation, New York.

Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J. (2018). *"The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution"*. World Bank, Washington, DC <https://doi.org/10.1596/978-1-4648-1259-0>.

Drexler, A., Fischer, G., and Schoar, A. (2014). "Keeping it simple: financial literacy and rules of thumb". *American Economic Journal: Applied Economics,* V.6(2), 1.31. <https://doi.org/10.1257/app.6.2.1>.

Fernandes, D., Lynch Jr, J.G., and Netemeyer, R.G. (2014). "Financial literacy, financial education, and downstream financial behaviours". *Management Science, V.60(8), 186-2109.*

FINCA homepage. www.finca.org.

Freedom from Hunger (FFH). <https://www.freedomfromhunger.org/>.

Fundación Capital (2017). *"New Heights. Annual Report 2017"*. Fundación Capital https://fundacioncapital.org/wp-content/uploads/2018/06/Annual-Report-2017-1.pdf.

Gabor, D. and Brooks, S. (2016). "The digital revolution in financial inclusion: international development in the fintech era". *New Political Economy, V.22(4), 423-436.*

Garcia, A. and Lensink, R. (2019). "Microfinance-Plus: a review and avenues for research", in M. Hudon, M. Labie, and A. Szafard (eds), *A Research Agenda for Financial Inclusion and Microfinance*, pp. 111-24, Edward Elgar Publishing Ltd, Cheltenham, UK.

GSMA (2019). *"Mobile Industry Impact Report: Sustainable Development Goals"*. https://www.gsma.com/betterfuture/wp-content/uploads/2019/10/2019-09-24-a60d6541465e86561f37f0f77ebee0f7-1.pdf.

Gubhert, F. and Roubaud, F. (2011). *"The Impact of Microfinance Loans on Small Informal Enterprises in Madagascar. A Panel Data Analysis"*. World Bank, Washington, DC https://openknowledge.worldbank.org/handle/10986/27328.

Hilgert, M., Hogarh, J., and Beverly, S. (2003). "Household financial management: the connection between knowledge and behaviour". *Federal Reserve Bulletin July, pp. 309–322* <https://www.federalreserve.gov/pubs/bulletin/2003/0703lead.pdf>.

Innovation for Poverty Action (IPA) (2018). *"Beyond the Classroom: Evidence on New Directions in Financial Education"*. Innovation for Poverty Action <https://www.poverty-action.org/sites/default/files/publications/Beyond-the-Classroom-Financial-Education-Brief.pdf>

ILO, (2015). International Labour Organization, https://www.ilo.org/empent/areas/social-finance/WCMS_396578/lang--en/index.htm.

Kaahwa, M., Zhu, Ch., Muhumuza, M., Mutyebere, R., and Mawenu, R. (2019). "Assessing the efficacy of audio media technology in enhancing financial literacy knowledge of radio listening club members: a case of selected rural communities in western Uganda". *Proceedings of the 8th Teaching and Education Conference,* Vienna. *International Institute of Social and Economic Sciences, Prague, Czech Republic* .DOI: 10.20472/TEC.2019.008.011.

Kaiser, T., and Menkhoff, L. (2017). *"Does Financial Education Impact Financial Literacy and Financial Behaviour, and If so, When?"*. World Bank Policy Research Working Papers WPS8161.

Kantar IMRB (2018). "*21st edition ICUBE: Digital Adoption and Usage Trends"*. KANTAR, India <https://imrbint.com/images/common/ICUBE%E2%84%A2_2019_Highlights.pdf>.

Karlan, D. and Valdivia, M. (2011). "Teaching entrepreneurship: impact of business training on microfinance clients and institutions". *The Review of Economics and Statistics, V.93(2), 510-527.*

Karlan, D., Ratan, A.L., and Zinman, J. (2014). "Savings by and for the poor: a research review and agenda". *Review of Income and Wealth, V.60(1), 36-78.*

Leatherman, S., Metcalfe, M., Geissler, K., and Dunford, C. (2011). "Integrating microfinance and health strategies: examining the evidence to inform policy and practice". *Health Policy and Planning, V.27(2), 85-101.*

Lusardi A. and Mitchell, O.S. (2014). "The economic importance of financial literacy: theory and evidence". *Journal of Economic Literature V.52(1), 5-44.*

McIntosh, C., Villaran, G., and Wydick, B. (2011). "Microfinance and home improvement: using retrospective panel data to measure program effects on fundamental events". *World Development, V.39(6), 922-937.*

McKenzie, D. and Woodruff, C. (2014). "What are we learning from business training and entrepreneurship evaluations around the developing world?". *World Bank Research Observer, V. 29(1), 48-82.*

Mader, P. (2017). "Contesting financial inclusion", *Development and Change* 49(2): 461–83

Maity, S. (2019). "Financial inclusion and multidimensional poverty reduction through self-help-group-led microfinance: evidence from Bodoland, Assam, India". *Enterprise Development and Microfinance,* V.30(3).

Mandell, L. and Schmid Klein, L. (2007). "Motivation and financial literacy". *Financial Services Review, V.16, 105-116.*

Mundy, S. (2009). "Financial education programmes in schools". *OECD Journal: General Papers 2008, V.(3), 53-127.*

Mundy, S. (2011). *"Financial Capability: Why Is It Important and How Can It Be Improved?".* CfBT Education Trust. Berkshire, UK.

OECD (2019). *"PISA 2018 Assessment and Analytical Framework"* PISA, OECD Publishing, Paris <https://doi.org/10.1787/b25efab8-en>.

Ontiveros, E, Martín Enriquez, A and Lopez Sabater, V. (2014*) "Microfinanzas y TIC. Experiencias Innovadoras en Latinoamérica".*
Fundación Telefónica and Analistas Financieros Internacionales (AFI).

Risal, N. (2018). "Microfinance position and indebtedness: empirical evidence from microfinance institutions in Nepal". *Pravaha, V.24, 120-36.*

Rusiná, E., Pellegrina, L., di Maio, G. and Landoni, P. (2015). *"Money Management and Entrepreneurial Training in Microfinance: Impact on Beneficiaries and Institutions".* Working Paper. University of Milan Bicocca No.296 March 2015.

Schicks, J. (2013). "The definition and causes of microfinance over-indebtedness: a customer protection point of view". *Oxford Development Studies, V.41(1), 95-116.*

Schicks, J. (2014). "Over-indebtedness in microfinance: an empirical analysis of related factors on the borrower level". *World Development, V.54, 301-24.*

Sen, G.and De, S. (2018). "How Much Does Having a Bank Account Help the Poor?". *The Journal of Development Studies, V.54 (9), 1551-1571.*

Tang, N. and LaChance, M.E. (2012) 'Financial advice: what about low-income consumers?' *Journal of Personal Finance* 11(2): 121–158.

Ujjivan Financial Services, (2019).
https://www.ujjivan.com/html/financial_literacy_program.php

United Nations (UN). "2030 Global Agenda"
<https://www.un.org/sustainabledevelopment/development-agenda/>.

Urquía-Grande, E. and del Campo, C. (2017)." Socio-economic factors determining the commitment to participate in an agricultural development project in rural Ethiopia". *Iberoamerican Journal of Development Studies, V.6(2), 4-27.*

Verrest, H. (2013). "Rethinking micro entrepreneurship and business development programs: vulnerability and ambition in low-income urban Caribbean households". *World Development, V.47, 58–70.*

Vor der Bruegge, E., Dickey, J.E., and Dunford, C. (1999). *"Cost of Education in the Freedom from Hunger Version of Credit with Education Implementation".* Freedom from

Hunger Research, Paper No. 6. https://www.semanticscholar.org/paper/Cost-of-Education-in-the-Freedom-from-Hunger-of-Dunford/10b22e0998fd3241691550259daaeb327473c674

Xu, L. and Zia, B. (2012). "*Financial Literacy Around the World: An Overview of the Evidence with Practical Suggestions for the Way Forward*". World Bank, Washington, DC.

4

Chapter 4. Delving into determinants of default risk in Self-Help groups: Empirical evidence from Ecuador[6]

Abstract

Financial inclusion has been broadly recognized as critical in alleviating poverty and achieving inclusive economic growth. The capability of borrowers to repay their microcredit loans is a critical concern and is the first risk of Microfinance institutions sustainability. Exploring the determinants of credit risk is an issue of substantial importance in microfinance. The purpose of this research was to identify the savings group members' characteristics that have impact on default risk. We have used a multivariate regression model to identify the factors that affect default behaviour among micro-credit borrowers from savings groups. We have analysed a sample of more than different 400 Savings Groups and 7,251 active users of the "Saving and Learning" program in Ecuador. Empirical results demonstrated that factors such as seniority, accumulated savings and the number of members in the savings groups are determinant variables of default risk. The significant positive sign on variable "Gender" is consistent with previous authors that indicate that the probability of having problems in loan repayment is higher for males than for females. The generalizability of our findings should, of course, be interpreted with caution, as they may be idiosyncratic of the sample, period, or region. To contrast and contextualize these results we had in-depth discussions with the SAVINCO managers and their field agent in Ecuador. There are many contributions. For practitioners, relevant factors that can affect savings groups default rates have been identified. For academics, the rich information provided by the SAVINCO mobile App could be a starting point for further quantitative research.

Keywords: Informal Finance; Savings groups; Default risk; Information and Communication Technologies; Ecuador.

4.1 Introduction

Despite the important growth of microfinance over the last decades, there is a profound debate about its effectiveness as a development tool, the impact on the more vulnerable population, and the roles of the private and public sectors in poverty reduction (Karnani, 2017, 2011; Mader, 2017, 2013). Although there has been immense progress in the level of financial inclusion, measured by the number of accounts, there are still 1.7 billion adults (31 per cent of the global adult population) excluded from the financial sector. The profile of the unbanked usually consists of low net-worth individuals, mainly woman, living in rural areas and with little or no collateral (Demirgüc-Kunt et al., 2018). In addition to this, financial inclusion must be measured not only by access to financial products but, more importantly, by their quality and use, placing the focus on financial health and not only on financial inclusion (Arellano, Cámara and Mejía, 2019; Karlan et al., 2017). Given the difficulty for formal microfinance institutions to reach the rural poor, money lenders are sometimes the only finance solution for this vulnerable population (Madestam, 2014), therefore in the past few years, foundations and non-profit organizations (NPO) have placed efforts into promoting informal finance solutions such as Self-Help Groups (SHGs) or Savings Groups (SGs) to help improve financial inclusion of the rural poor (Giné and Karlan, 2014; Kodongo and Kendi, 2013; Adusei, 2013; Bouman, 1983). The rationale of these type of models are so that members of the group simultaneously save, lend and apply for credit and since borrowers know each other, this mitigates adverse selection problem and repayment. In addition, group meetings facilitate education and training, helping members with little experience to improve their businesses financial performance (Armendáriz and Morduch, 2005). Moreover, groups contribute to the empowerment of women helping them sustain their home-based microenterprises (Duflo, 2012). Although group micro lending has been a successful idea in many parts of the world, it can be expensive given the additional cost of group formation, training, group procedures and monitoring of regular meetings where installments are paid (Savita, 2007).

Recently, new actors have come into this market aiming to improve the model of traditional informal Savings Groups by the development and use of new Information and Communication Technologies (ICTs). One of these actors is Savinco Social Finance (SAVINCO) promoted by Expert Timing Systems (ETS) a Spanish high-tech company specialized in quantitative finance. SAVINCO mission is to improve socio-economic inclusion of the most vulnerable population in Latin America by promoting community savings, a solution based on four pillars: self-financing through savings, self-management, financial education and technology. The technological pillar includes the development of an advanced cloud-mobile App, Qmobile, to monitor group financial transactions. The purpose of the App is to help group members to manage more efficiently their monthly meetings (savings, paid-in capital, loans, received and due interest) and to improve financial education by new innovative cost-effective teaching contents and methods.

In this chapter we analyse the information provided by one of the most active savings groups programs in Ecuador named "Saving and Learning" designed and managed by

SAVINCO. The purpose of this research is to identify which variables determine the sustainability of savings groups and the profile of customers that could default on loan payments based on the information provided by the cloud-mobile App. Even though the meaning of Default and Non-performing loans are not exactly the same we will be using both terms indistinctly throughout the paper. The database includes information of over 400 savings groups and 9.000 customers during the period 2014-2020.

By using real user's data, this paper defines the following research questions:

RQ 4.1: What are the determinants of savings group members default risk?

RQ 4.2: Does gender influence default on loan repayments?

This research has the following structure: In Section 2 we discuss the literature and contextualise the origin of Microfinance and Savings Groups followed by a description of the SAVINCO's "Saving and Learning" programme in Ecuador. Section 3 presents the data, instrument and method used for the analysis. Section 4 provides the results. Section 5 includes findings, discussion and conclusions. As interesting results, we can highlight variables such as group seniority, accumulated savings, number of members and average loan term that can affect default risk. Additionally, conclusions for academics can be that the rich information provided by the Mobile App, Qmobile, could be a starting point for further quantitative research. Finally, we highlight the importance of the use of technology to improve savings groups' efficiency and survival. Future lines of research include the design of a credit scoring for groups and individuals that will help them enter formal financial institutions together with a post-COVID impact analysis.

4.2 State of the art

4.2.1 Microfinance evolution

Financial inclusion has been broadly recognized as critical in alleviating poverty and achieving inclusive economic growth. Undeniably, there is a close relationship between economic development and financial inclusion (Deb and Kubzansky, 2012). Demirgüc-Kunt et al. (2018) showed in the Global Findex 2017, that between 2011 and 2017 the number of people with a bank account grew by 1.2 billion worldwide. However, 1.7 billion adults (31 per cent of the global adult population) remain unbanked, most of whom are women living in rural areas in developing countries. Other important results of the Global Findex 2017 are the most common reason for not having an account. The principal one is the lack of money, 66 per cent of adults without an account identified this as the primary reason, and 20 per cent said it was the only reason. Other reasons include (in order of diminishing importance): no necessity for an account; accounts are too expensive; financial institutions are located too far away; lack of enough credit information; lack of trust in financial institutions and religious reasons (Mookherjee and Motta, 2016; Giné and Karlan, 2014; Karlan, Ratan and Zinman, 2014). In other occasions the problem is that they are excluded by other members

of the group (Marr, 2004; Hulme and Mosley, 1996). However, there is also the case that although they are creditworthy, micro-entrepreneurs have no interest in borrowing from formal institutions because they do not understand or trust the banking system (Ciravegna, 2006) or they do not have a "savings culture" (Adusei, 2013; Ashraf, Karlan and Yin, 2006; Benartzi and Thaler, 2004; Duflo et al., 2006; Van Rooyen, Stewart and de Wet, 2012).

The absence of formal financial institutions in rural areas drove Yunus to develop the idea of microcredit in the early 80's in Bangladesh (Yunus, 2003). In its original vision, the microfinance concept consisted of giving small loans, primarily to female entrepreneurs at the bottom of the pyramid, for productive and survival purposes. These women were unserved by the regular banks because of the lack of collateral or simply because they did not have easy access to banks. The primary purpose was to provide an alternative way of finance to the oppressive regime of traditional moneylenders, which was the only source of credit available to the most vulnerable population. Moneylenders were viewed as exploitative of poor borrowers, often charging usurious interest rates (Mookherjee and Motta, 2016; Pellegrina, 2011). Yunus's proposal was based on the idea of the close relationship between economic development and financial inclusion (Deb and Kubzansky, 2012). The final purpose of providing access to financial services to the unbanked population was to improve the quality of life of the more vulnerable and to promote entrepreneurship as a way out of poverty (Morris, Santos and Neumeyer, 2018).

The core of Grameen´s innovation was "the group". The group-based approach enables poor people to accumulate capital by way of small savings and facilitates their access to informal credit facilities. Borrowers at most Microfinance Institutions (MFIs) were organized into groups with joint liability; if anyone in the group is unable to repay his/her loan each other member of the group should pay for some portion of the loan obligation. This system promotes close monitoring of individual behavior by the group (Karlan, 2007; Ghatak, 2000). Group borrowers tend to be less delinquent than individual borrowers (Mokhtar, Nartea and Gan, 2009).

The second Yunus´s core purpose was the focus on women because they are more vulnerable. Worldwide women have been historically disadvantaged in terms of education, social exclusion, discrimination, and access to assets or other resources (Demirgüc-Kunt et al., 2018; Raihan and Uddin, 2018; Fafchamps et al., 2011; Pitt and Khandker, 1998). In addition, women are considered better administrators than men and are more concerned about their families. FMBBVA (2019) stated that supporting women means supporting the following generations. Although women's access to credit has improved in the last few years, there is still a strong gap between women and men (Demirgüc-Kunt et al., 2018). Currently, following the United Nations 2030 Sustainable Development Goals (United Nations, 2015), various policies and support mechanisms are being implemented to elevate the status of women to fulfil international recommendations. Finally, Microcredit groups usually have weekly or monthly meetings where members repay their loan installments and serve both as a social occasion and as an opportunity to receive financial literacy training.

MFIs have expanded rapidly all around the world, according to the Microfinance Barometer 2018, reaching 139 million low-income clients with a loan volume of US $114 billion in 2017. Lately MFIs have undergone a huge transformation, offering a wider range of financial products and services and many of them have become formal/regulated institutions (e.g., Gutierrez-Nieto and Serrano-Cinca, 2019; Giné and Karlan, 2014; Van Rooyen, Stewart and de Wet, 2012; Hermes and Lensink, 2009 among others).

However, in the last decade, Yunus's vision has been questioned because of the proliferation of MFI's applying aggressive lending practices to extend the borrower base. As a result, there were "over indebtedness" and "loan overlapping", meaning borrowers taking loans from one MFI to pay back another (Haldar and Stiglitz, 2016). In 2011, India's SKS Microfinance ambitious project produced a serious MFI´s repayment crisis and trust on these type of projects (Mader, 2013, 2017; Ghosh and Ray, 2016; Pole, Asawa and Shah, 2014). Moreover, although much economic and financial literature has highlighted the importance of microfinance as a factor in development, there is an intense debate about its effectiveness as a development tool given the multidimensional components of poverty (Maity, 2019; Ditcher, 2007). Some researchers even suggest that microcredits may have a negative impact on the most vulnerable (Cull, Demirgüc-Kunt and Morduch, 2018; Bateman and Chang, 2009; Vogelgesang, 2003; Prahalad and Hammond, 2002) with over-indebtedness and lack of financial education being some of the main problems (Bali and Varghese, 2013; Berge et al., 2012). Authors like Gutiérrez-Nieto and Serrano-Cinca (2019) believe microfinance is a robust banking idea but not as an anti-poverty intervention on its own. Pollin and Feffer (2007) suggested that credit accessible to poor people is a laudable aim, however as a tool against global poverty, microcredit should be judged by its effectiveness.

Currently, a profound digital revolution is taking place, characterised by unstoppable technological advances (Ochoa, de Salas Lasagabaster, and Robredo Núñez, 2016). This digital revolution not only affects mobile communications and new ICT solutions, but also the microfinance industry. Mobile phones, and other technological devices, had an exponential increase in recent years; this is mainly due to the global investment in mobile network and the design of low-price devices. Seven out of ten homes belonging to the poorest 20 per cent of the population have a mobile phone (GSMA, 2019; Global Microscope, 2019). Ontiveros, Martín Enriquez, and Lopez Sabater (2014) claim that increasing digitization of financial services provides enormous potential for improving financial inclusion with less expensive financial services models, more accessible and efficient, such as branch-less banking models or mobile payment with simple text-based phones.

Microfinance Institutions can be classified in three different groups: deposit-taking institutions like commercial banks, credit-only non-deposit taking institutions, and informal organizations. The latter category includes savings groups (SGs), club pools and financial services associations and this is the area where we are going to concentrate our research (Kodongo and Kendi, 2013; Kirkpatrick and Maimbo, 2002). The purpose of these informal

organizations is to provide finance to the population that is excluded from the formal financial sector.

4.2.2 Savings groups

In recent years and parallel to the development of the microfinance industry, many non-profit organizations (NPOs) and social enterprises have begun to promote savings-lending groups among the more vulnerable population. Nelson (2013) suggests that savings groups must be the starting point for financial inclusion. These savings groups (SGs) emulate and improve Yunus´s original idea of voluntary formed groups of borrowers applying for credit with joint liability (Yunus, 2003).

Foundations and development organizations have mobilized over 700,000 savings groups in vulnerable communities across 75 countries worldwide (Allen, 2018). A systematic review of 53 studies conducted between 2004 and 2017, carried out by Gash (2017, 2013) concludes that SGs have a positive impact on household savings, access to credit, asset accumulation, consumption, business investment and social capital. Thus, SGs are considered a first step for unbanked customers to become formally financial included (Ballem, Ghiyazuddin and Venkata, 2012). So, when SG´s members demonstrate their capacity to repay their debts, bank loans can be accessible for them.

SGs were originated from the Rotating Savings and Credit Associations (ROSCA) that was described by Bouman (1983) as "the poor man's bank". ROSCA are created on informal appreciation among friends or family and tend to have simple structures. Each SG acts as a financial institution owned and managed by the group members. The basic element is the group, and the most effective component is the "forced" saving element. Members regularly contribute money to a common pot that is assigned to each member in turn. Most of the time, the order is predetermined. The group meets regularly for the repayment of loans, and allocation of proceeds. Money is not idle for long but changes hands rapidly, satisfying both consumption and production needs (Gugherty, 2007; Armendáriz and Morduch, 2005). The risks of this system are the difficulty to increase the size of the number of resources, the impossibility to move resources across communities, the right allocation of resources when the pot is excessive, and the high interest rates. The ROSCA concept has been adapted to the needs and characteristics of different countries (Gigante, 2017; Umuhire, 2013; Ardener, 1964) so that some sort of short-term savings club can be found in most low-income communities around the world. For example, the denominated "Tontine" in rural Cameroon, where members contribute with a fixed amount that is assigned fully to one of its members (Nzemen, 1988). In Asia a "Hui" is organized in a way that members can bid for the pot (Ardener, 1964). The system called "Likelemba", mostly used in the Democratic Republic of Congo, is a common container or "pot" assigned to one of the group members, it works as a "turbine" where the money flows from one group member to the next in the following meeting (Urquía-Grande, Rautiainen and Perez-Estébanez, 2017). In Latin America the most common format is the mutuality which is called differently along the countries: for

example, "Tanda" in Mexico and "Polla" in Chile. Mutualities are more organized and have more rigid structures than a family group (Armendáriz and Morduch, 2005).

SGs are informal associations consisting of 10 to 20 members, usually women from similar social backgrounds, that have voluntary come together with the purpose of improving their economic situation out of mutual help, solidarity and joint responsibility (Wydick, Hayes and Kempf, 2011). Some of the SGs characteristics are small sized memberships, homogeneity of composition, cohesiveness and effective participation of members in the functioning of the group (Husain, Mukherjee and Dutta, 2010). Additionally, usually SGs offer poor women a platform to receive information regarding financial education, health, nutrition and governance (Shivaprasad, 2020; Navajas et al., 2000). The majority of the SGs are promoted and driven by NPOs.

Most of these types of SGs follow the same three basic principles: joint liability, regular meetings and no grants in the common "pot", only members' savings. Joint liability means that if anyone in the group is unable or unwilling to repay, each member of the group should pay for some portion of the loan obligation. Joint liability increases repayment because borrowers know each other and try to avoid risky profiles. An incentive for the repayment of group loans is the joint liability. Repayment improves among borrowers with strong social ties and deteriorates among borrowers with weak social ties (de Quidt, Fetzer and Ghatak, 2016; Maria, 2009; Conning, 2005). In addition, group reputation could affect individual credit rating for future access to credit. Attanasio et al. (2013) suggest that joint liability will also prevent borrowers from using loans for non-investment purposes.

The second principle, and probably the most important, is the regular meetings. Initially conceived for screening the repayment of loans, they are also used for facilitating member training on financial and business skills and monitoring loan use. Feigenberg et al. (2014) found out that an increase in the meeting frequency created social capital, which led to a subsequent improvement in repayment rates.

The third principle is that there are no grants in the common pot, only member's savings. All the money in the pot is put together and is allocated for different borrowers each time. This group-lending model is becoming more flexible in relation to the quantity of the contributions and the fact that participants could be entitled to the loan without waiting for their turn.

Dellien et al. (2005) discusses key differences between group lending and individual lending regarding screening and monitoring. In Savings groups, the group pressure, and social ties reduce repayment risk, while individual lending repayment discipline is created by strict enforcement of contracts.

SGs relational model is very intensive in terms of transactions, given the number and size of loans, and the number of repayment sessions, therefore transaction cost can be very high (Karlan, 2007). As a result, it is necessary to promote the use of technology to maintain a proper bookkeeping and accounting system to help controlling the regular meetings

transactions (receipts, vouchers, cash books, members individuals' books) as the time consumed in meetings.

4.2.3 Default risk

The capability of borrowers to repay their microcredit loans is a very important issue and is the first risk of MFI´s sustainability. Default is a failure to repay a debt including interest or principal on a loan or security and can occur when a borrower is unable to make timely payments, misses payments, or stops making payments. Default not only causes a reputational effect on the group but also has an impact towards future borrowing capacity and group formation. Individuals and businesses can fall into default when they are not able to keep up with their debt obligations. A high rate of non-performing loans (NPL) is one of the main causes of bank failures. Exploring the determinants of ex post credit risk is an issue of substantial importance for financial stability and for bank´s management (Reinhart and Rogoff, 2010). However, factors affecting loan delinquency in microfinance can be dramatically different from developed countries (Kodongo and Kendi, 2013; Field, Pande and Papp, 2010). In contrast to commercial banks, microfinance institutions cannot secure loans with collateral or screen borrowers, given the lack of assets or reliable financial information. MFIs prefer to offer group lending contracts when the size of the loan is high, transferring the monitoring role to the group of borrowers (Giné and Karlan, 2009; Maria, 2009).

Potential factors determining loan delinquency among microfinance customers have been widely covered in the literature (Baland, et al., 2017; Beg and Bashir, 2017; Muthoni, 2016; Field and Pande, 2008; Adongo and Stock, 2005; Churchill, 2004; Norell, 2001 among others). These factors include interest rates, age, loan amount, repayment period and loan category (group or individual). In relation to loan category, Kodongo and Kendi (2013) suggest that group-lending programs are more effective than individual lending programs in mitigating the risk of default. Individual loans are three times more likely to default on their microcredit obligations than group borrowers, the reason being that, although everyone is responsible for repaying their own loans, if any member defaults, other members will have to repay the loan (Baland et al., 2017). Al-Azzam, Hil and Sarangi's (2012) empirical analysis, suggests that peer monitoring, group pressure and social ties reduce delinquency. In addition, group lending allows MFIs to identify individuals within the groups whose credit risk has improved and issue them progressive individual loans.

Another factor of discussion in loan default risk is group gender composition (Banerjee et al., 2015; Giné and Karlan, 2014; Adusei, 2013). A higher percentage of female clients in MFIs are associated with a lower portfolio risk, fewer write-offs, and fewer provisions (D'Espallier, Mersland and Guerin, 2011). Eckel and Grossman (2002,1998) find that women are more cooperative than men and their behavior is not as selfish. In theory, females have a stronger internalization of pro-social values than men; therefore, it would be expected that women might be less likely to default on their loan payments. Furthermore, repayment of loans represents one kind of cooperative behavior. When tension exists

between the individual interest and the welfare of the group, women are more likely to make choices that contribute to group welfare. In addition, people tend to behave in accordance with those around them even against their own interest (de Mel, McKenzie and Woodruff, 2009; Hermes and Lensink, 2009; Anthony and Horne, 2003). The influence of others can be affected by the behavior of other group members (Karlan et al., 2017; Prina, 2015; Karlan, Ratan, and Zinman, 2014).

In relation to group sizes there are different theories. Ahlin (2015) highlights the benefits of larger group size based on the intragroup monitoring role, while other authors such as Conning (2005) argue that too large groups with loose social ties may not be able to enforce the cooperative agreements necessary for group repayment.

In terms of age, Mokhtar, Nartea and Gan (2009) and Bhatt and Tang (2002) suggest that older borrowers are more responsible and disciplined in repaying their loans than younger borrowers. The lack of experience in the involved business could be one of the reasons for younger borrowers not to repay their loans.

The amount of the loan and terms are other factors that can affect client delinquency (Norell, 2001). Mirpourian et al. (2016) considers that repayment rates increase as borrowers get closer to the loan limit. Some authors like Field and Pande (2008) explain that a less rigid repayment schedule would decrease default rates. The problem is not the loan term but the repayment capacity. MFIs should consider lowering the weekly repayment amount and providing longer duration of payments in response (Mokhtar, Nartea and Gan, 2009).

Many authors consider interest rates one of the most important factors in microfinance default risk (Le Polain, Sterck and Nyssens, 2018). In fact, savings groups were born to serve the unbanked and to protect them from the abusive interest rates charged by moneylenders. Group lending interest rates were lower than individual lending because group joint liability reduces default risk. Authors such as Kodongo and Kendi (2013) confirm that high interest rates increase the chances of client delinquency. Other authors consider that high interest rates are necessary for first time borrowers. This dynamic individual contract involves a "penalty" interest rate after default, and favourable rates after success (Ahlin and Waters, 2014).

Ultimately, the lack of financial skills is one of the main problems for micro-entrepreneurs when managing their micro-business. It has been proven that financial education improves micro-credit beneficiaries' financial outcomes (López-Sánchez et al., 2020; Drexler, Fischer and Schoar, 2014; de Mel, McKenzie and Woodruff, 2014; Deb and Kubzansky, 2012; Karlan and Valdivia, 2011). The impact of training programmes improves when tuition is adapted to the micro-entrepreneur's needs.

Finally, other factors could be taken into account as determinants of default risk such as inflation rates (Owusu-Manu et al., 2016), weather conditions (Golden, Wang and Yang, 2007), financial health (Ashraf, 2020) or political crisis (Cuadra and Sapriza, 2008)

occurring in a country. However, in this research they will not be taken into account, as they are considered too macroeconomic and volatile for the constructed model.

4.2.4 Ecuador

The economy of Ecuador is the eighth largest in Latin America with a GDP of 107.4 billion dollar and mainly lives from agriculture and oil. In the past few years Ecuador has been facing serious economic and social problems, such as large inequality gaps, informal economy and low income. Likewise, access to credit, availability of ATMs or Internet access is very low in rural areas (ASOMIF Ecuador, 2019).

The Global Microscope has been building for years a ranking of countries in relation to the enabling environment for financial inclusion, which consists of a weighted and dynamic model of assigning scores to a series of selected indicators. During the past few years Ecuador has had a significant deterioration in the Global Microscope ranking. It has gone from a sixth outstanding position in the 2009 to the 26th position in 2019. The main cause of this deterioration is the lack of a political environment to ensure the provision of affordable and quality financial services in the country and that Ecuador does not have a national strategy for financial inclusion or concrete plans for the digital transformation of the country (Global Microscope, 2019).

The difficulties to access formal credit in rural areas have led to the creation of informal intermediaries such as savings groups. Groups of people, mainly women, that save and periodically contribute a quantity of money to a common "pot" that will give loans among their own members. The effectiveness of savings groups is based mainly on the social sanctions that occur if a member of the group does not pay back its loan. A limitation of this model lies in the low amounts of savings and credit generated (Bicciato et al., 2020).

We chose Ecuador because of the dramatic economic situation together with the importance of Saving Groups in microfinance programs in the country

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4.3 Sample and Model specifications

SAVINCO designed a program called "Saving and Learning" based on the community lending groups model with the purpose of starting a trend of self-sustainable improvement in the quality of life of families living in poverty. SAVINCO applies a self-finance and self-managed socio-economic inclusion model, which starts by promoting community savings. This solution is based on four pillars: financial education, self-financing through savings, self-management and technology. The main beneficiary of SGs has been the most vulnerable population.

These types of programs are intensive in terms of human resources, given the high number of transactions in the regular meetings. As a result, SAVINCO decided to apply new ICTs to make the management of the meetings more accessible, convenient and safe and

developed an advanced cloud-mobile technology called Qmobile. This online platform main purpose was to help group members to manage more efficiently their regular meetings, helping them recording all financial transactions (savings, paid-in capital, loans, received and due interest). In addition, Qmobile is used to improve financial education, to monitor group-lending transactions and to evaluate impact on vulnerable populations. SAVINCO implemented the "Saving and Learning" program in Peru and Ecuador. Ecuador program being the largest one with over 400 savings groups and over 9.000 active members, managed by the groups themselves with the advice of coaches.

SAVINCO provided the authors with access to data already anonymized for the total "Saving and Learning" Ecuadorian program members in such a way that the data subjects would not be identifiable. Concretely, the only personal available data for each individual is their gender and age together with some of their financial history within the program, ensuring each individual's privacy is protected.

Hence, using the data from the Ecuadorian cloud-mobile SAVINCO platform Qmobile from the year 2014 to 2020, we have tried to answer our research questions. The initial sample consisted of the 9,392 active users of the Ecuadorian micro-credit app Qmobile on the extraction date of February 6th, 2020. However, there were some profiles with some missing data related to age and birth dates that could not be estimated, without a history of borrowing and/or with less than three months of seniority so they were not considered in the analysis. Hence the working sample consisted on 7,251 users. Gender distribution of those remaining 7,251 users can be seen in Figure 4.1. Most of those users were females (70.8%), which is common in this type of informal savings institutions.

Figure 4.1 Distribution by gender.
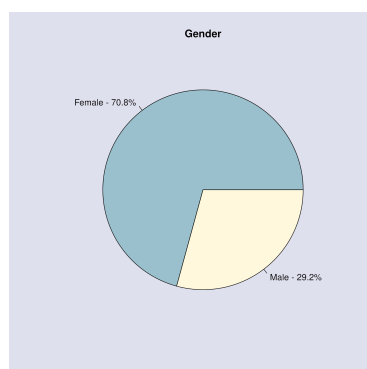
4.3.1 Model specification. Dependent variable

As it was stated before we are interested in analyzing the possibility of the users of this Ecuadorian micro-credit app Qmobile to incur in non-performing loans (NPL). In banking, commercial loans are usually considered NPL if the borrower is 90-180 days past due, however Qmobile classifies a loan as NPL as soon as the user fails to meet his/her monthly

instalment. Nevertheless, most users regularize their situation in the following group meeting, so that the most usual term for NPL duration is the month between consecutive meetings. Among Qmobile Ecuador app users the NPL rate is quite small (see Table 4.1) as the users with no history of NPL behaviour are 94.79 per cent of the total active users.

Table 4.1 NPL frequencies and percentages.

0	1	2	3	4	5	6	7	8	9	10	11	12
6,873 (94.79%)	241 (3.32%)	67 (0.92%)	25 (0.34%)	17 (0.23%)	11 (0.15%)	6 (0.08%)	5 (0.07%)	1 (0.01%)	2 (0.03%)	1 (0.01%)	1 (0.01%)	1 (0.01%)

Due to our interest in studying whether micro-credit borrowers incurred in NPL, we transformed this variable counting the number of times a user is past due into a binary one. Therefore, our dependent variable (NPL) represents the user's credit status, with value 1 denoting existence of NPL and 0 standing for the on-time repayment of all previous loans.

4.3.2 Model specification. Independent variables

There are several aforementioned variables that the literature identifies for being the most prominent loan repayment determinants in the microfinance industry. A brief explanation of each variable included in our model as independent variables is given in Table 4.2 and, to facilitate understanding and identification, codes X1 to X9 are assigned for variables related to users and Z1 to Z7 for variables related to groups.

Table 4.2 Variables considered in the study.

Code	Description	Possible Values
X1. Gender	User's gender	Female Male
X2. Rural	Whether group area is rural or not	Yes No
X3. Received.Loans	User's number of previously received loans	Discrete variable
X4. Seniority	User's number of months in the group	Discrete variable
X5. Age	User's age measured in years	Discrete variable
X6. Average.Loan.Term	Average term of all the loans the user has had in the past measured in months	Discrete variable
X7. Average.Loan	Average amount ($) of all the loans the user has had in the past	Continuous variable
X8. Total.Received.Amount	Total amount ($) that the user has borrowed in the past	Continuous variable
X9. Accumulated.Savings	User's accumulated savings ($)	Continuous variable
Z1. Current.Capital	Group capital at data extraction ($)	Continuous variable
Z2. Initial.Capital	Group capital at founding ($)	Continuous variable
Z3. Current.female.percent	Group percentage of females at data extraction	0-1
Z4. Initial.female.percent	Group percentage of females at group founding	0-1
Z5. Group life	Group life measured in months	Discrete variable
Z6. Current.members	Group number of members at data extraction	Discrete variable
Z7. Initial.members	Group number of members at group founding	Discrete variable

Although interest rates are a determinant variable mentioned by several papers (e.g., Ahlin and Waters, 2014; Kodongo and Kendi, 2013), in our model they are not included, because in our sample all customers bear the same interest rate of 5 per cent per month that remains stable and affordable.

4.3.3 Model specification. Methodology

We follow a quantitative and qualitative research methodology. A multivariate logistic regression model was fitted to the data to identify the factors that affect the NPL behaviour on Qmobile users in Ecuador.

Logistic regression models are commonly used to study effects of predictor variables on a categorical one, usually with binary outcomes, such as the present case where the variable of interest is whether a Qmobile user incurs in NPL. When there are multiple predictors (e.g., age, gender, activity...) that are hypothesized to influence the outcome, the model is referred to as a multivariable logistic regression model. Logistic regression is more adequate than other techniques because it only assumes a binomial distribution for the prediction error, as well as the conditional mean of the binary outcome. Furthermore, logistic regression does not assume a multivariate normal distribution for the independent variables as, for example, discriminant analysis does. For a more extended explanation on logistic regression see, for example, Hosmer, Lemeshow, and Sturdivant (2013).

All calculations were carried out in R (R Core Team, 2021), version 3.6.3 running on Xubuntu 20.04.

Our results were contrasted and contextualised with SAVINCO managers through various interviews, discussions and meetings to help us gain a deeper understanding of the results and correct the possible biases from unobserved individual situation.

4.4 Results

The current Qmobile users are organised in 409 active savings groups, with other 76 groups no longer active. The group life ranges from three to 64 months, with the median group life being 24 months. The groups currently contain from 9 up to 88 members, with a median size of 20, and the median female percentage is currently 69.23 per cent, with a variation from 33 per cent to 100 per cent. Finally, current group capital ranges from $350 to $88,070, with a median value of $6,450. The descriptives of these group variables are included in Table 4.3.

Table 4.3 Group descriptives.

	Min	Mean	Median	Max	St.Dev.
Z1. Current. Capital	$350	$9,865.00	$6,450.00	$88,070	$11,372.93
Z2. Initial. Capital	$30	$314.80	$180.00	$18,335	$1,043.89
Z3. Current.female.percentage	33	69.65	69.23	100	0.12
Z4. Initial.female.percentage	0	68.86	68.75	100	0.16
Z5. Group life (months)	3	26.5	24.0	64	17.35
Z6. Current.members	9	27.44	24.00	88	12.60
Z7. Initial.members	0	16.63	15.00	56	6.82

Descriptives by NPL behaviour for the individual user continuous variables are presented in Table 4.4. It is interesting to observe how the maximum values for all four variables are much higher for those users with no NPL past behaviour (NPL=0). However, the median is in all four cases smaller than for those users with NPL behaviour (NPL=1), as it is the mean, except for the accumulated savings (X9).

Table 4.4 User descriptives by NPL behaviour.

	NPL behaviour	Min	Mean	Median	Max	St.Dev.
X6. Average.Loan.Term (months)	NPL = 0	1.00	5.55	4.75	60.00	3.55
	NPL = 1	1.00	7.26	6.00	52.00	5.25
X7. Average.Loan	NPL = 0	$5.00	$344.50	$250.00	$6,573.30	$354.39
	NPL = 1	$44.78	$421.30	$302.33	$4,062.50	$374.48
X8.Total.Received.Amount	NPL = 0	$5.00	$2,032.00	$1,174.00	$72,233.00	$2,837.39
	NPL = 1	$94.00	$2,841.40	$2,056.00	$35,048.00	$2,913.79
X9.Accumulated.Savings	NPL = 0	$0.00	$342.90	$235.00	$9,430.00	$411.19
	NPL = 1	$0.00	$336.90	$267.50	$2,130.00	$259.88

Finally, for a complete overview of the user's independent variables that are included in the model, a summary of the frequencies, percentages and default rates of the qualitative and discrete variables is presented in Table 4.5. Default rate is calculated by dividing the number of members that have defaulted (NPL=1) by total members.

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Table 4.5 Frequencies and percentages of user characteristics.

Variable	Value	NPL = 0	NPL = 1	Total	NPL rate
	All	6,875	378	7253	5.21%
X1. Gender	Female	4,885 (71.05%)	247 (65.34%)	5,132 (70.76%)	4.81%
	Male	1,990 (28.95%)	378 (34.66%)	2,121 (29.24%)	6.18%
X2. Rural	Yes	2,911 (42.34%)	131 (34.66%)	3,042 (41.94%)	4.31%
	No	3,964 (57.66%)	247 (65.34%)	4,211 (58.05%)	5.87%
X3.Received.Loans	≤ 1	902 (13.12%)	17 (4.50%)	919 (12.67%)	1.85%
	2-5	3,355 (48.80%)	163 (43.12%)	3,518 (48.50%)	4.63%
	6-10	1,718 (24.99%)	121 (32.01%)	1,839 (25.36%)	6.58%
	11-20	792 (11.52%)	62 (16.40%)	854 (11.7)	7.26%
	21-30	90 (1.31%)	8 (2.12%)	98 (1.35%)	8.16%
	30-40	13 (0.19%)	7 (1.85%)	20 (0.28%)	35.00%
	> 40	5 (0.07%)	0 (0.00%)	5 (0.07%)	0.00%
X4.Seniority (months)	≤ 12	2,696 (39.21%)	56 (14.81%)	2,752 (37.94%)	2.03%
	25-24	1,834 (26.68%)	83 (21.96%)	1,917 (26.43%)	4.33%
	25-36	1,178 (17.13%)	69 (18.25%)	1,247 (17.19%)	5.53%
	37-48	768 (11.17%)	66 (17.46%)	834 (11.50%)	7.91%
	49-60	228 (3.32%)	69 (18.25%)	297 (4.09%)	23.23%
	> 60	171 (2.49%)	35 (9.26%)	206 (2.84%)	16.99%
X5.Age (years)	≤ 18	103 (1.50%)	4 (1.06%)	107 (1.48%)	3.74%
	18-25	1,016 (14.78%)	53 (14.02%)	1,069 (14.74%)	4.96%
	25-40	2,481 (36.09%)	137 (36.24%)	2,618 (36.10%)	5.23%
	40-55	2,108 (30.9%)	107(28.31%)	2,215 (30.54%)	4.83%
	55-70	968 (14.08%)	55 (14.55%)	1,023 (14.10%)	5.38%
	> 70	199 (2.89%)	22 (5.82%)	221 (3.05%)	9.95%

Out of 7,251 analysed users, there are only 378 with non-performing loans, a mere 5.21 per cent, hence the NPL rate is quite small among the Qmobile users that had ever borrowed money. Furthermore, by examining Table 4.5 it appears that as age increases, the proportion of individuals with NPL increases. Something similar seems to happen both with seniority and with the number of received loans. Finally, it also appears that being a male and not belonging to a rural area increases slightly the probability of NPL behaviour.

The degree of multicollinearity among the explanatory variables has been tested using variance inflation factor (VIF) test. The post-estimation model results presented in Table 4.6 show that the value of variance inflation factor ranges between 1.08 and 4.94 (all of them below 5), implying that the data have no multicollinearity problems among explanatory variables used in the multivariable logistic regression model (James et al. 2013).

Table 4.6 Post-estimation VIF tests.

Variables	VIF
X1. Gender	1.111531
X2. Rural	1.218682
X3. Received.Loans	4.090211
X4. Seniority	4.764794
X5. Age	1.079317
X6. Average.Loans.Term	1.841376
X7. Average. Loan	3.169891
X8. Total.Received.Amount	4.565030
X9. Accumulated.Savings	2.447600
Z1. Current. Capital	4.941217
Z2. Initial. Capital	1.321156
Z3. Current.female.percent	2.202914
Z4. Initial.females.percent	2.088687
Z5. Group Life	3.957181
Z6. Current. Members	3.863196
Z7. Initial. Members	1.542326

Maximum likelihood estimates of the parameters in the logistic regression model characterizing the NPL behaviour of Qmobile users are presented in Table 4.7. It must be noted that the estimated coefficients do not directly indicate the effect of change in our explanatory variable of NPL behaviour. Those estimated coefficients indicate the effect of each individual explanatory variable on the probability of the NPL behaviour occurring. Particularly, a positive (negative) coefficient means that the log of odds {ln [Probability/(1-Probability)]} increases (decreases) as the corresponding variable increases.

Table 4.7 Parameters in the logistic regression model.

	Estimate	Std. Error	z value	Pr(>|z|)		Odds ratio
(Intercept)	-3.85081	0.44602	-8.634	< 2e-16	***	0.0213
X1.Gender[T.Male]	0.21182	0.12571	1.685	0.09199	*	1.2359
X2.Rural[T.Yes]	-0.13206	0.12914	-1.023	0.30649		0.8763
X3.Received.Loans	-0.02789	0.01922	-1.451	0.14680		0.9725
X4.Seniority	0.04884	0.00676	7.218	5.26e-13	***	1.0500
X5.Age	0.00238	0.00396	0.602	0.54699		1.0024
X6.Average.Loans.Term	0.04237	0.01689	2.507	0.01217	**	1.0433
X7.Average. Loan	0.00071	0.00032	2.221	0.02636	**	1.0007
X8.Total.Received.Amount	0.00008	0.00004	1.794	0.07283	*	1.0001
X9.Accumulated.Savings	-0.00282	0.00041	-6.776	1.24e-11	***	0.9972
Z1.Current. Capital	-0.00003	0.00001	-2.023	0.04304	**	0.9999
Z2.Initial. Capital	-0.00016	0.00024	-0.657	0.51107		0.9998
Z3.Current.female.percent	0.06146	0.65754	0.093	0.92553		1.0634
Z4.Initial.females.percent	-0.91763	0.48893	-1.877	0.06054	*	0.3995
Z5.Group Life	0.03200	0.00604	5.295	1.19e-07	***	1.0325
Z6.Current. Members	-0.02823	0.00846	-3.335	0.00085	***	0.9722
Z7.Initial. Members	0.03736	0.00813	4.595	4.32e-06	***	1.0381

Signif. codes: * p < 0.1, **p < 0.05, ***p < 0.01

The result of the Hosmer-Lemeshow test (chi square = 7253; df = 8; p < 2.2e-16) indicates no evidence of poor fit. Hence it is confirmed that the model fits the data. The estimated logit model is given by the following expression:

Logit{NPL = 1/ independent variables} = -3.85081 + 0.21182 X1 - 0.13206·X2
- 0.02789·X3 + 0.04884·X4 + 0.00238 X5 + 0.04237·X6 + 0.00071·X7 + 0.00008·X8
- 0.00282·X9 - 0.00003·Z1 - 0.00016·Z2 + 0.06146·Z3 - 0.91763·Z4 + 0.03200·Z5
- 0.02823·Z6 + 0.03736·Z7

Overall, most of the explanatory variables had expected signs. Particularly, gender, seniority (individual), total received amount, average loan, average loan term, group life, and initial members had a consistently positive and significant effect (at 10 per cent level) on NPL behaviour. Accumulated savings, current capital (group), number of current members (group), and initial female´s percentage (group) have also a significant effect on defaulting, but negative, meaning the higher the value of the variables, the lower the probability of NPL behaviour. However, neither age nor the number of received loans, rural, group initial capital or the current female percentage (group) have any significative effect on NPL behaviour.

It is of special importance gender (male) and initial female´s percentage because of their odds ratio deviation from 1. Concretely, the odds of a male incurring in NPL behaviour are 1.2359 times greater than the odds for females. Additionally, for each point increase on the initial percentage of female in the group, the odds of the members of that group incurring in NPL behaviour decreases from 1 to 0.3995.

4.5 Findings Discussion

In our research we have analyzed the relative importance of several factors on the probability of default using a sample of 7,251 active users of the "Saving and Leaning" Program developed in Ecuador by SAVINCO from 2014 to 2020. All these users had been with the organization for at least three months. In this section we will discuss our findings.

SGs are being used in many parts of the world as a strategy to give access to financial services to the population in the bottom of the pyramid with the final objective of reducing poverty. Nevertheless, the inherent risk attached to these small loans is a major concern for MFIs and NPOs. Understanding SGs member's characteristics could play an important role in reducing loan default rates.

The potential factors determining microcredit default have been analysed in line with Adongo and Stock (2005); Field, Pande and Papp (2010); Kodongo and Kendi (2013) and Muthoni (2016). Most of these studies have been performed for specific countries and years limiting the generalizations to other countries or situations. Nevertheless, there are some borrower's characteristics examined in the present research that are significant in most of these studies. These factors include gender, age, number of loans, loan amount, and repayment period.

It is very interesting to observe that the average default rate in our sample is 5.21 per cent which is relatively low in comparison with Ecuador default rate of Microcredits issued by Cooperativas (Savings and Loan Associations) which was 5.88 per cent in September 2019, and much lower than public banks with a microcredit default rate of 7.76 per cent (Ocaña, 2018). A possible explanation for this fact might be that traditional banks have a higher percentage of individual loans that are associated with higher default rates than group lending (Kodongo and Kendi, 2013; Mokhtar, Nartea and Gan, 2009) and that financial education improve savings and the responsible use of the loan.

The significant positive sign on "Gender (Male)" is consistent with previous authors that indicate that the probability of having problems in loan repayment is higher for males than for females. A higher percentage of female's clients in MFIs is associated with a lower portfolio risk, fewer write-offs, and fewer provisions (Adusei, 2013; Banerjee et al., 2015; D'Espallier, Mersland and Guerin, 2011; Giné and Karlan, 2009). Although the gender variable was significant only at a 10 per cent level, the odds of a male incurring default are 1.24 times greater than the odds for females.

Although "Age" is not statistically significant in our model, the NPL rate of customers over 55 years is higher than the average NPL rate (see table 4.5). These results are not consistent with the research carried out by Mokhtar, Nartea and Gan (2009) and Bhatt and Tang (2002). Both suggest that older borrowers have more experience and would be more responsible in repaying their loans than younger borrowers.

"Seniority" and "Group Life" coefficients are both positive and significant at a 0.1 level. SAVINCO managers pointed out that the "Seniority" result might be logical, as they have observed that users tend to be less risk adverse after years being part of a savings group and may become over-indebted. Consequently, a similar consequence might happen with "Group Life". We recommend that before granting a new loan, records of borrowers' financial obligations in other institutions should be required.

Accumulated savings is inversely related to NPL, and significant at a 0.1 level. Accumulated savings represents individual savings, therefore it is expected that borrowers with a high level of savings have less of a chance of default, since it would be against their own interest.

Furthermore, results suggest that Average loan and Average loan term are significant factors (both at 5 per cent level) influencing directly the chance of default. This result is opposite to authors such as Mokhtar, Nartea and Gan (2009) who defend that the lower the loan amount, the higher the chance of default since low loan amounts are mostly extended to first business beginners who lack experience and larger amounts are mostly granted to more experienced borrowers. They also suggest that a weekly loan repayment schedule posed problems for borrowers who generate a lower revenue cycle and suggested that MFIs should consider lowering the weekly repayment amount and providing a longer duration of payments in response. Furthermore, Kodongo and Kendi (2013) suggest that larger loan amounts are associated with fewer incidents of delinquency. Moreover, SAVINCO managers explained that the average loan term is not an important factor in client delinquency but the size of the regular payments, and suggest that regular installments should not be higher that a 30 per cent of their salary. SAVINCO managers affirm that the problem is not the loan term but the regular repayment capacity.

Initial and Current Members are both significant (at 0.1 per cent) but in opposite directions. Initial Members is positively related to default, while Current Members is inversely related to default. SAVINCO managers explain that large initial members relationship with higher default rates might be due to the fact that members do not know each other well enough and there is not a clear leader and group procedures, in line with Conning (2005) that suggests that broad initial groups may not be able to enforce the cooperative agreements necessary for group repayment. On the contrary, the result that Current Members is inversely related to default is consistent with literature that suggest that after some time, larger groups know each other well and can take greater advantage of local information reducing adverse selection and moral hazard (Ahlin, 2015). It is also well known that diversification can reduce risk and sufficiently large groups can attain first-best lending.

Finally, SAVINCO managers are concerned about financial training and are implementing more active leanings methodologies using the mobile platform and quality control measures. They stated that it is important to observe the beneficiaries' behavior in relation to debt recurrence to prevent them from over-indebtedness. As hypothesised, given the financial education provided in the regular repayment meetings, the higher the number of attended sessions the better prepared microcredit beneficiaries are to make appropriate decisions regarding loan size and repayment period.

4.6 Conclusions

Savings groups programs have expanded rapidly all around the world providing an alternative way of financing for excluded population. Although there is abundant literature about microfinance impact, outreach and sustainability (Gutierrez-Nieto and Serrano-Cinca, 2019; Van Rooyen, Stewart and de Wet, 2012; Hermes and Lensink, 2009), there is scarce research about the determinants of loan repayment in micro-credit savings groups. The purpose of this research was to identify the savings group members' characteristics that minimise default risk. We have analyzed a sample of more than 400 SGs and 7,253 active users of the "Saving and Learning" program, developed by SAVINCO in Ecuador from 2014 to 2020. The information was extracted from the cloud-mobile App Qmobile that records all group lending transactions.

We have used a binary logistic regression model to identify the factors that affect the non-performing loan or default behaviour among micro-credit borrowers from savings groups in Ecuador, which led to interesting findings.

As a result, our first conclusion is the necessity of these groups to control over-indebtedness. We recommend a break period between loans, since after years of continuously borrowing SGs members could tend to be less risk adverse. In addition, before granting a new loan records of borrowers' financial obligations at other institutions should be required. Regarding the loan size and term, we consider that the important factor is the regular repayment instalments. They should not be more than 30 per cent of their regular income as SAVINCO managers suggested. In relation to group size, too broad initial groups could be a factor of concern since joint liability might not work well if members do not know each other or do not have strong family ties.

Furthermore, the use of technology in SGs should be promoted. Although the main purpose of the Qmobile platform was to help group members efficiently manage their monthly meetings, the on-line data allows users and managers to perform a continuous follow up and quality control of the program. In addition, this App is a perfect channel to provide financial education to SGs members. The challenge is to generate long-term saving habits and management skills that will allow users to improve their financial health and consequently improve their life conditions.

The contributions of this paper could de classified in contributions for practitioners, academics and development institutions. For practitioners, based on the results of this study,

we have identified relevant factors that can affect SGs default rates. For academics, the rich information provided by the Mobile App could be a starting point for further quantitative research once the financial education App is designed. Finally, for international development institutions, we suggest that all the actors involved such as the government, NPOs and MFIs should work together to provide the necessary framework to promote the use of technologies for financial inclusion and education. Cooperation among the different actors is the only way to achieve economic growth in a sustainable and inclusive way.

No study is without limitations. First of all, the generalizability of our findings might be restricted by our focus on one saving group platform in Ecuador. These results should, of course, be interpreted with caution, as they may be idiosyncratic of the period and region. A second potential limitation is that the information used was not complete, additional group members qualitative and socio-economic information will be needed to complete the borrower profile in order to produce comprehensive credit scoring. Last but not least, the information was extracted before COVID-19 pandemic that has greatly affected all levels of society worldwide.

Finally, the present results legitimize the authors to continue exploring on this area. There is a need for more research that can assist both lenders and borrowers achieve jointly economic growth in a sustainable and inclusive way. Future research lines include the design of a complete borrower's profile and credit scoring, including other variables such as inflation, weather conditions, political, financial or health crisis. We also plan to analyse the impact of COVID-19 on savings groups' programs defaults using panel data.

References

Adongo, J. and Stock, C. (2005). *"Factors Influencing the Financial Sustainability of Selected Microfinance Institutions in Namibia"*. Namibian Economic Policy Research Unit, Windhoek.

Adusei, M. (2013). "Determinants of Credit Union Savings in Ghana". *Journal of International Development, V.25, 22-30.*

Ahlin, C. (2015). "The role of group size in-group lending". *Journal of Development Economics, V.115, 140-155.*

Ahlin, C. and Waters, B.M. (2014). "Dynamic lending under adverse selection with limited borrower commitment: Can it outperform group lending?". *Journal of Development Economics, V.121, 237-257.*

Al-Azzam, M., Hil, R.C., and Sarangi, S. (2012). "Repayment performance in group lending: evidence from Jordan". *Journal of Development Economics, V.97, 404-414.*

Allen, B. (2018*). "State of Practice: Savings Groups and the Dynamics of Inclusion"*. The SEEP Network. Available at: SEEP_State-of-Practice_Savings-Groups-and-the-Dynamics-of-Inclusion_20180925.pdf.

Anthony, D., and Horne, C. (2003). "Gender and Cooperation: Explaining Loan Repayment in Micro-Credit Groups". *Social Psychology Quarterly, V.66(3), 293-302.*

Ardener, S. (1964). "The Comparative Study of Rotating Credit Associations". *The Journal of the Royal Anthropological Institute of Great Britain and Ireland, V.94 (2), 201-229.*

Arellano, A., Cámara, N. and Mejía D. (2019). "Disentangling Vulnerability through Consumer Behavior: The Role of Financial Health". BBVA *Research Working Paper Nº 10/11*. https://www.bbvaresearch.com/wp-content/uploads/2019/08/WP_Financial_Health_Vulnerability_0812.pdf .

Armendáriz, B., and Morduch J. (2005). *"The Economics of Microfinance"*. Cambridge, MA: MIT press.

Ashraf, B.N. (2020). "Stock markets' reaction to COVID-19: Cases or fatalities?". *Research in International Business and Finance, V.54, 101249.*

Ashraf, B.N., Karlan, D. and Yin, W. (2006). "Tying Odysseus to the mast: Evidence from a commitment savings product in the Philippines". *Quarterly Journal of Economics, V.121(2), 635-672.*

ASOMIF Ecuador (2019). *"Construyendo el futuro de la inclusión financiera en ecuador. Memoria diciembre 2019"*. https://asomifecuador.com/wp-content/uploads/2019/12/memoria_alianza_2019.pdf.

Attanasio, O., Augsburg, B., De Haas, R., Fitzsimons, E. and Harmgart, H. (2013). "Group Lending or Individual Lending? Evidence from a Randomized Field Experiment in Rural Mongolia". *Center Discussion Paper Series No. 2013-074.*

Baland, J.M., Gangadharan, L., Maitra, P. and Somanathan (2017). "Repayment and exclusion in a microfinance experiment". *Journal of Economic Behaviour and Organization, V.137(C), 176-190.*

Bali, S.R. and Varghese, A. (2013). "Delivery mechanisms and impact of microfinance training in Indian self- help groups". *Journal of International Development, V.25, 11-21.*

Ballem, A., Ghiyazuddin A.M., and Venkata N.A. (2012). "*Why Do People Not Join or Drop Out of SHGs?*". Microsave market-led-solutions for financial services. https://www.findevgateway.org/sites/default/files/publications/files/mfg-en-paper-why-do-people-not-join-or-drop-out-of-shgs-may-2012.pdf .

Banerjee, A., Duflo, E., Glennerster, R., and Kinnan, C. (2015). "The Miracle of Microfinance? Evidence from a Randomized Evaluation". *American Economic Journal: Applied Economics, V.7 (1), 22-53.*

Bateman, M. and Chang, H. (2009). "The microfinance illusion*". SSRN Electronic Journal, DOI: 10.2139/ssrn.2385174*

Beg, K. and Bashir, H.A. (2017). "An Empirical Analysis of Factors affecting the Loan Repayment Performance of Microfinance Institutions". *Pacific Business Review International, V.10 (2), 144-153.*

Benartzi, S. and Thaler, R. (2004). "Save more tomorrow: Using behavioural economics to increase employee savings". *Journal of Political Economy, V.112 (2), 5164-5187.*

Berge, L.I.O., Bjorvatn, K., Juniwatya, K.S. and Tungoddena, B. (2012). "Business training in Tanzania: From research-driven experiment to local implementation". *Journal of African Economies, V.21(5), 808-827.*

Bhatt, N. and Tang, S-Y. (2002). "Determinants of Repayment in Microcredit: Evidence from Programs in the United States". *International Journal of Urban and Regional Research, V.26(2), 360-376.*

Bicciato, F., Foschi, L., Bottaro, E. and Ivardi Ganapini, F. (2020). "*Microfinanzas en países pequeños de América Latina: Bolivia, Ecuador y El Salvador*". CEPAL SERIE Desarrollo productivo, N 121.
https://www.cepal.org/sites/default/files/publication/files/4506/S022121_es.pdf

Bouman, F.J.A. (1983). "*Indigenous savings and credit societies in the developing world*". Washington: World Bank.

Churchill, C.F. (2004). "La microfinance est-elle une priorité pour les pauvres? Comprende la demande de services financiers de gestion des risques". *ADA Dialogue, V.33, 11-30.*

Ciravegna, D. (2006). "The role of microcredit in modern economy: the case of Italy". *Flacso working paper, Costa Rica.*

Conning, J. (2005). "Monitoring by Peers or by Delegates? Joint Liability Loans and Moral Hazard". *Economics Working Paper Archive at Hunter College* 407, Hunter College Department of Economics. https://ideas.repec.org/p/htr/hcecon/407.html.

Cuadra, G. and Sapriza, H. (2008). "Sovereign default, interest rates and political uncertainty in emerging markets". *Journal of International Economics, V.76 (1), 78-88.*

Cull, R., Demirgüc-Kunt, A., and Morduch J. (2018). "The Microfinance Business model: Enduring Subsidy and Modest Profit". *The World Bank Economic Review, V.32 (2), 221-224.*

D'Espallier, B., Mersland, R., and Guérin, I. (2011). "Women and Repayment in Microfinance: A Global Analysis". *World Development, V.39 (5), 758-772.*

de Mel, S., Mckenzie, D., and Woodruff C. (2009). "Are women more credit constrained? Experimental evidence on gender and microenterprise returns". *American Economic Journal: Applied Economics, V.1 (3), 1-32.*

de Mel, S., McKenzie, D. and Woodruff, C. (2014). "Business training and female enterprise start-up, growth, and dynamics: Experimental evidence from Sri Lanka". *Journal of Development Economics, V.106, 199-210.*

de Quidt, J., Fetzer, T., and Ghatak, M. (2016). "Group lending without joint liability". *Journal of Development Economics, V.121, 217-236.*

Deb, A., and Kubzansky, M. (2012). *"Bridging the Gap: The Business Case for financial capability"*. Citi Foundation and GIIN.

Dellien, H., Burnett, J., Gincherman, A., and Lynch, E. (2005). *"Product Diversification in Microfinance: Introducing Individual Lending. Women's"*. World Banking Report, New York.

Ditcher, T. (2007). *"Hype and Hope: The Worrisome State of the Microcredit Movement"*. Legal City Legal Magazine 26.

Demirgüc-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J. (2018). *"The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution"*. The World Bank. https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1259-0.

Drexler, A., Fischer, G., and Schoar, A. (2014). "Keeping It Simple: Financial Literacy and Rules of Thumb". *American Economic Journal: Applied Economics, V.6, 1-31.*

Duflo, E. (2012). "Women Empowerment and Economic Development". *Journal of Economic Literature, V.50 (4), 1051-1079.*

Duflo, E., Gale, W., Liebman, J., Orszag, P. and Saez, E. (2006). "Saving Incentives for low- and middle- income families: evidence from a field experiment with Hand R block". *Quarterly Journal of Economics, V.121 (4), 1311-1346.*

Eckel, C.C. and Grossman, P.J. (1998). "Are Women Less Selfish Than Men? Evidence from Dictator Experiments". *The Economic Journal, V.108 (448), 726-735.*

Eckel, C.C., and Grossman, P.J. (2002). "Sex Differences and Statistical Stereotyping in Attitudes towards Financial Risks". *Evolution and Human Behavior, V.23 (4), 281–295.*

Fafchamps, M., McKenzie, D., Quinn, S., and Woodruff, C. (2011). "When is capital enough to get female microenterprises growing? Evidence from a randomized experiment in Ghana". *Policy Research Working Papers. World Bank.*

Feigenberg, B., Pande, R., Rigol, N., and Sarkar, S. (2014). "Do Group Dynamics Influence Social Capital and Female Empowerment? Experimental Evidence from Microfinance". *Journal of Policy Analysis and Management, V.33 (4), 932-949.*

Field, E., and Pande, R. (2008). "Repayment frequency and default in microfinance: evidence from India". *Journal of the European Economic Association, V.6, 501–509.*

Field, E., Pande, R., and Papp, J. (2010). *"Does microfinance Repayment Flexibility Affect Entrepreneurial Behavior and Loan Default?"*. Microfinance Gateway, 6. https://www.moodys.com/microsites/miic2010/presentationfiles/Field.pdf.

FMBBVA - Fundación Microfinanzas BBVA (2019). *"Informe de Desempeño Social* 2019". www.fundacionmicrofinanzasbbva.org.

Gash, M. (2013). *"Pathways to Change: The Impact of Group Participation"*. In C. Nelson (ed) Savings Groups at the Frontier, pp. 101–125. Rugby, UK: Practical Action.

Gash, M. (2017). *"Understanding the Impact of Savings Groups"*. The SEEP Network. https://seepnetwork.org/files/galleries/Understanding.pdf.

Ghatak, M. (2000). "Screening by the company you keep: Joint liability lending and the peer selection effect". *The Economic Journal, V.10 (465), 601-631.*

GSMA (2019). *"Mobile Industry Impact Report: Sustainable Development Goals"*. https://www.gsma.com/betterfuture/2019sdgimpactreport/wp-content/uploads/2019/09/SDG_Report_2019_ExecSummary_Web_Singles.pdf.

Ghosh, P., and Ray, D. (2016). "Information and Enforcement in Informal Credit Markets". *Economica, V.83, 59-90.*

Gigante, S. (2017). *"Tanda, hui, or ayuuto? The money pool way"*. MassMutual Blog. https://blog.massmutual.com/post/money-pools.

Giné, X., and Karlan, D. S. (2014). "Group versus individual liability: Short- and long-term evidence from Philippine microcredit lending groups". *Journal of development Economics, V.107, 65-83.*

Global Microscope (2019). *"The enabling environment for Financial Inclusion and the expansion of digital financial services"*. E.I.U- Economist Intelligence Unit New York, NY, EIU. https://www.centerforfinancialinclusion.org/global-microscope-2019

Golden, L. L., Wang, M.L. and Yang, C.H. (2007). "Handling weather related risks through the financial markets: Considerations of credit risk, basis risk, and hedging". *Journal of Risk and Insuranc*e, V.74(2), 319-346.

Gugherty, M.K. (2007). "You can´t save alone: Commitment in rotating savings and credit associations in Kenya". *Economic Development and Cultural Change, V.55, 251-282.*

Gutierrez-Nieto, B., and Serrano-Cinca, C. (2019). "20 years of research in microfinance: An information management approach". *International Journal of Information Management, V.47, 183-197.*

Haldar, A., and Stiglitz, J.E. (2016). "Group Lending, Joint Liability, and Social Capital: Insights from the Indian Microfinance Crisis". *Politics and Society, V.44(4), 459–497.*

Hermes, N., and Lensink, R. (2009). "Microfinance: its impact, outreach and sustainability". *World Development, V39, 875–881.*

Hosmer Jr, D.W., Lemeshow, S., and Sturdivant, R.X. (2013). *"Applied logistic regression"*. 3rd Edition. Hoboken, NJ: John Wiley and Sons.

Hulme, D., and Mosley, P. (1996). *"Finance against poverty"*. London, UK: Routledge.

Husain, Z., Mukherjee, D., and Dutta, M. (2010). "Self-help groups and empowerment of women: self- selection or actual benefits?". *Journal of International Development, V.26(4), 422-437.*

James, G., Witten, D., Hastie, T., and Tibshirani, R. (2013). *"An Introduction to Statistical Learning: With Applications in R"*. New York: Springer.

Karlan, D. (2007). "Social connections and group banking". *The Economic Journal, V.117 (517), F52–F84.*

Karlan, D., Ratan, A.L., and Zinman, J. (2014). "Savings by and for the poor: A research review and agenda". *Review of Income and Wealth, V60 (1), 36-78.*

Karlan, D.S., Savonitto, B., Thuysbaert, B., and Udry, C.R. (2017). "Impact of savings groups on the lives of the poor". *Proceedings of the National Academy of Sciences, V.114, 3079-3084.*

Karlan D., and Valdivia, M. (2011). "Impact of business training on microfinance clients and institutions". *Review of Economics and Statistics, V.93 (2), 510-527.*

Karnani, A. (2011). "*Fighting poverty together: Rethinking strategies for business, governments, and civil society to reduce poverty*". New York: Palgrave Macmillan.

Karnani, A. (2017). "The roles of the private and public sectors in poverty reduction". *Journal of Marketing and Management, V.33 (118), 1585-1592.*

Kirkpatrick, C., and Maimbo, M. (2002). "The implications of the evolving microfinance agenda for regulatory and supervisory policy". *Development Policy Review, V.20 (3), 293-304.*

Kodongo, O., and Kendi, L.G. (2013). "Individual lending versus group lending: An evaluation with Kenya's microfinance data". *Review of Development Finance, V.3 (2), 99-108.*

Le Polain, M., Sterck, O., and Nyssens, M. (2018). "Interest Rates in Savings Groups: Thrift or Threat?". *World Development, V.101(c), 162-172.*

López-Sánchez, P., Urquía-Grande, E., del Campo, C., and Rivero-Menendez, M.J. (2020). "The importance of accounting for micro-credit beneficiaries in developing countries". *Enterprise Development and Microfinance, V.31 (4), 268-283.*

Mader, P. (2013). "Rise and Fall of Microfinance in India: The Andhra Pradesh Crisis in Perspective". *Strategic Change, V.22(1-2), 47-66.*

Mader, P. (2017). "Contesting Financial Inclusion". *Development and Change, V.49 (2), 461–483.*

Madestam, A. (2014). "Informal finance: A theory of moneylenders". *Journal of Development Economics, V.107, 157-174.*

Maity, S. (2019). "Financial inclusion and multidimensional poverty reduction through self-help-group-led microfinance: evidence from Bodoland, Assam, India". *Enterprise Development and Microfinance, V.30 (3), 152–173.*

Maria, L. (2009). "Group Lending Versus Individual Lending in Microfinance ". *No. 299. SFB/TR 15 Discussion Paper. University of Munich.*

Marr, A. (2004). "A challenge to the orthodoxy concerning microfinance and poverty reduction". *Journal of Microfinance, V.5 (2), 1-35.*

Microfinance Barometer (2018). http://www.convergences.org/wp-content/uploads/2018/09/BMF_2018_EN_VFINALE.pdf.

Mirpourian, S., Caragliu, A., Di Maio, G., Landoni, P., and Rusinà, E. (2016). "Determinants of loan repayment performance among borrowers of microfinance institutions: Evidence from India". *World Development Perspectives, V.1, 49–52.*

Mokhtar, S.T., Nartea, G., and Gan, C., (2009). "*Determinant of Microcredit Loan Repayment Problem among Microfinance Borrowers in Malaysia*". http://www.microfinancegateway.org/gm/document-1.9.57549/.

Mookherjee, D., and Motta, A. (2016). "A theory of interactions between MFIs and informal lenders". *Journal of Development Economics, V.121, 191-200.*

Morris, M.H., Santos, S.C., and Neumeyer, X. (2018). "*Poverty and entrepreneurship in developed economies*". Cheltemham, UK: Edward Elgar Publishing.

Muthoni, P. (2016). "Assessing Borrower's and Business' Factors Causing Microcredit Default in Kenya: A Comparative Analysis of Microfinance Institutions and Financial Intermediaries". *Journal of Education and Practice, V.7, 97-118.*

Navajas, S., Schreiner, M., Meyer, R.L, Gonzalez-Vega, C., and Rodríguez, J. (2000). "Microcredit and the poorest of the poor: Theory and evidence from Bolivia". *World Development, V.28 (2), 333-346.*

Nelson, C (2013). "*Savings Groups at the Frontier*". Practical Action Publishing.

Norell, D. (2001). "How to reduce arrears in Microfinance institutions". *Journal of microfinance, V.3, 115-130.*

Nzemen, M. (1988). "*Théorie de la pratique des tontines au Cameroun*". Yaoundé: Société de presse et d'éditions du Cameroun.

Ocaña, E. (2018). "*Formalización de las Microfinanzas y su impacto en el Desarrollo del Sistema Financiero Ecuatoriano*". Superintendencia de Bancos, Documento de Trabajo No. 2.

Ochoa, B., de Salas Lasagabaster, A., and Robredo Núñez, M. (2016). "*El Nuevo modelo de creación de valor de la banca basado en tecnologías disruptivas*". *Mindsait – Indra.* https://www.minsait.com/es/actualidad/insights/el-nuevo-modelo-de-creacion-de-valor-de-la-banca-basado-en-las-tecnologias.

Ontiveros, E., Martín Enriquez, A., and Lopez Sabater, V. (2014). "*Microfinanzas y TIC. Experiencias Innovadoras en Latinoamérica*". Fundación Telefónica and Analistas Financieros Internacionales (AFI).

Owusu-Manu, D., Parn, E. A., Donkor-Hyiaman, K., Edwards, D. J. and Blackhurst, K. (2016). "The relative importance of mortgage pricing determinants in mortgage affordability in Ghana An ex post attribution". *Journal of Engineering Design and Technology, V.14 (3), 563-579.*

Pellegrina, L.D. (2011). "Microfinance and Investment: A comparison with bank and informal lending". *World Development, V.39 (6), 882-897.*

Pitt, M., and Khandker, S.R. (1998). "The impact of group-based credit programs on poor households in Bangladesh: Does the gender of participants matter?" *Journal of Political Economy, V.106 (5), 958–996.*

Pole, P., Asawa, A., and Shah, D. (2014). "A critical evaluation of the SKS microfinance fiasco". *Indian Journal of Finance, V.8 (6), 7-21.*

Pollin, R., and Feffer, J. (2007*). "Microcredit: False Hopes and Real Possibilities. Is microcredit the solution to global poverty? Yes and no....*". Foreign policy in Focus. https://fpif.org/microcredit_false_hopes_and_real_possibilities/.

Prahalad, C.K. and Hammond, A. L. (2002). "Serving the world's poor, profitably". *Harvard Business Review, V.80 (9), 48-57.*

Prina, S. (2015). "Banking the Poor via Savings Accounts: Evidence from a Field Experiment". *Journal of Development Economics, V.115(C), 16-31.*

R Core Team (2021). *R: A language and environment for statistical computing.* R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

Raihan, M. and Uddin, M.J. (2018). "Creating women's capabilities through microcredit in Bangladesh". *Sri Lanka Journal of Social Sciences, V.41 (2), 111–122.*

Reinhart, C. and Rogoff, K. (2010). "Growth in a Time of Debt". *American Economic Review: Papers and Proceedings, V.100, 573-578.*

SAVINCO (2020). Savinco Social Finance. www.savingo.org.

Savita, S. (2007). "Transaction costs in group microcredit in India". *Management Decisions, V.45, 1331–1342.*

Shivaprasad, G. (2020). "Role of microfinance - Transforming the social conditions of women SHG". *Test Engineering and Management, V.83, 2668-2680.*

Umuhire P.G. (2013). "*Informal Finance and Formal Microfinance: The Rationale of their Coexistence in the Context of Urban African Financial Markets*". Presses Universitaires de Louvain.

United Nations (2015). "*Transforming our World: The 2030 Agenda for Sustainable Development*". https://sustainabledevelopment.un.org/post2015/transformingourworld/publication.

Urquía-Grande, E., Rautiainen, A., and Pérez-Estébanez, R. (2017). "The effectiveness of rural versus urban non-profit organisations in the Democratic Republic of Congo". *Third World Quarterly, V.38 (9), 2129-2142.*

Van Rooyen, C., Stewart, R., and de Wet, T. (2012). "The impact of Microfinance in Sub-Saharan Africa: A systematic review of the evidence". *World Development, V.40 (11), 49-62.*

Vogelgesang, U. (2003). "Microfinance in times of crisis: The effects of competition, rising indebtedness, and economic crisis on repayment behaviour". *World Development, V.31(12), 2085-2114.*

Wydick, B., Hayes, H.K., and Kempf, S.H. (2011). "Social networks, neighbourhood effects and credit access: Evidence from rural Guatemala". *World Development, V.39(6), 974-982.*

Yunus, M. (2003). "*Banker to the Poor Micro-Lending and the Battle Against World Poverty*". Perseus Books LLC.

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Chapter 5. Global findings, discussion and conclusions

Financial inclusion remains a key political and social imperative. For many years MFIs have been seen as an efficient tool to reduce poverty given the double economic and social mission. However, in the last few years there has been a big debate regarding MFI impact on the life of the poor. Some research even suggests that microfinances can have a negative impact on the more vulnerable. In addition, events such as Compartamos IPO in 2007 and the Andhra Pradesh "No Pago movement" in 2010 are generating controversy and affecting the legitimacy of the whole microfinance sector. We believe that the microfinance sector needs to develop a broader concept of financial inclusion using new digital technologies and increasing cooperation among all the actors involved.

Financial exclusion is both a result and an obstacle to the development of the poorest populations and their communities, but opening a bank account or accessing to finance through MFIs is only part of the challenge. Without the necessary financial skills, it is impossible for micro-entrepreneurs to manage their loans, make correct decisions and ensure their businesses grow in a sustainable way. It is often assumed that account ownership is the mayor cause of financial inclusion, but our analysis shows that it is the correct use of financial products what makes the difference in improving the lives of the more vulnerable. Some of the ways to increase financial inclusion is to improve the level of financial education, to increase trust in financial institutions and to encourage the use of mobile banking.

The lack of financial and accounting skills is one of the main problems for micro-entrepreneurs when managing their micro-business. Without the necessary financial skills, it is difficult for micro-entrepreneurs to manage their loans, understand interest rates or manage their business.

In the second chapter we conclude that there are many factors that can influence financial inclusion such as access to financial products, level of financial education, use of technology or alternative channels among others. Becoming part of the financial system requires customers to change their habits and increase trust on financial institutions. MFIs have to be sensitive social expectations regarding interest rates and profit margins when dealing with the poor. These institutions also need profits to assure sustainability but they have to be in line with the social expectations. The second chapter contributes to the debate over how to improve microcredit intervention's impact on the more vulnerable and identifies some unique insights into the interrelationships of financial education and financial inclusion.

Firstly, MFIs have problems reaching and serving the poor in remote rural areas and have to rely in banking agents or front-line officers. Frontline officers or banking agents are key figures in MFIs, because they have direct contact with the customers. They are the sales force, the revenue generators and the MFI's interface with clients; therefore training and retaining them should be a priority. Microfinance institutions should also introduce proper banking agents' performance indicators rather than repayment related ratios and create a mission culture among them.

Secondly, there are concerns that the microcredit market may be saturated and that intense competition between MFIs is pushing customers into over-indebtedness and high rotation. It is essential to re-address the MFI efforts in terms of customer needs, product flexibility or financial education among others. Our recommendation is to establish differentiated strategies for different levels of poverty. Different financial products should be offered depending on the customer's needs and profile. For example, Conditional Cash Transfer programmes and primary education is the responsibility of the government and should cover the extremely poor population. CCT programs have been the most important and effective social assistance interventions in Latin America and the Caribbean in the last 15 years. In the next level, savings groups programs particularly for women living in rural areas should be promoted. Finally, MFIs should focus on the more promising and sustainable 'upper micro' that have better chances to create jobs and survive.

Thirdly, all interviewees agreed that financial education can help improving microcredit impact but it should be adapted to the different levels of vulnerability.

Fourth, we are currently experiencing a profound digital revolution, characterised by unstoppable technological advances. This digital expansion also affects the microfinance industry, which has been strongly driven by the rapid adoption of mobile communications. These investments include digital ID systems, mobile communications, access to Internet and digital payment systems. The enormous growth of mobile banking has created a new opportunity to expand financial services to population living in remotes areas and reducing the gap between developed and developing economies in terms of financial inclusion. The way to increase account ownership is to improve the level of financial education, to increase trust in financial institutions and to encourage the use of mobile banking reducing the level of cash payments. Mobile money accounts will help reducing cash payments, and make money transfers between individuals and businesses faster, easier and available using electronic devices, especially smartphones.

Chapter three contributes to raise the attention to the level of accounting and financial education of the more vulnerable and the way it can be improved. The lack of financial and basic accounting skills is one of the main problems for micro-entrepreneurs when managing a micro-business. Recent evidence suggests that traditional financial education programmes have not been successful in improving financial knowledge or changing people's financial behaviour. Researchers agree that the impact improves when tutoring is adapted to the needs of micro-entrepreneurs, however the access to populations living in rural areas can be difficult and very expensive.

Thanks to the digital revolution and the use of mobile devices, new technology-based delivery channels can be implemented. MFIs should develop appropriate contents, methodology, and settings to ensure learning, because each micro-entrepreneur requires a different teaching approach. To accomplish this, financial and accounting education must be integrated into daily activities so that motivation to learn will be higher if training coincides with a financial decision.

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Regarding the content, one of the most important educational objectives is that microcredit beneficiaries should be able to record their daily transactions to better understand their business. This is the reason why we conducted an experiment with a sample of university students in Spain to test the effectiveness of a simple accounting tool, a cash flow template. We applied a randomized control trial to an intervention and control groups. Both groups were given a case study that described the transaction over three months of a female entrepreneur in rural Peru and asked them to record the transactions and develop some management information. The intervention group of students was also given a cash flow excel template, developed by the authors while the control group were just given the case study.

Our findings show that participants performed better in the intervention group, proving that the cash-template helped them recording transactions and understand the key variables of their business. It also helped raising awareness of the importance of using digital tools to improve the level of financial and accounting knowledge. Furthermore, the feedback provided by the students was very useful to improve our case study in order to apply the training in emerging countries. Another interesting finding is that most MFI´s are developing different training programmes with high involvement of university students and lecturers. This is a way to bridge the gap between Higher Education Institutions and the real world in line with Yunus (2003).

The challenge is to generate long-term financial habits and management skills that will allow microcredit borrowers to improve their financial health and consequently improve their life conditions. Our recommendation is that tutoring should be continuous, and loan beneficiaries should have access to training at any moment through mobile communication. It should cover a wide range of basic concepts such as differentiating between family and business expenses, loan use, savings, financial planning and commercial strategies, and basic accounting, which is essential, as it provides information on which to base decisions to plan, forecast, and control.

Finally, chapter fourth covers savings group's repayment problems. The capability of borrowers to repay their microcredit loans is a very important issue and is the first risk of Microfinance institutions sustainability. Exploring the determinants of credit risk is an issue of substantial importance. We applied a binary logistic regression model to a sample of more than 7.000 members of 400 savings groups from the SAVINCO´s "Saving and Learning program" in Ecuador trying to identify the factors that affect the non-performing loan behaviour, which led us to interesting findings.

As a result, our first recommendation within this chapter is the necessity to control over-indebtedness. We recommend a break period between loans, since after years of continuously borrowing SGs members could tend to be less risk adverse. In addition, before granting a new loan, records of borrowers' financial obligations at other institutions should be required. Regarding the loan size and term, we consider that the important factor is the regular repayment instalments. They should not be more than 30 per cent of their regular income as SAVINCO managers suggested. In relation to group size, too broad initial groups could be a

factor of concern since joint liability might not work well if members do not know each other or do not have strong family ties.

Furthermore, the use of technology in SGs should be promoted. Platforms such as Qmobile, developed by SAVINCO should be used to help group members efficiently manage their monthly meetings, and also a channel to provide financial education.

The data we present in this dissertation dates from before the pandemic, so it does not account for COVID-19 potential impacts. COVID-19 Pandemic has forced vulnerable population to embrace new digital technologies. MasterCard (2020) has reported that approximately 40 million people across Latin American have become banked over the past few months but this situation presents opportunities and challenges. In addition, the current COVID-19 environment has created an unprecedented challenge for microfinance institutions that are supporting the most vulnerable population and at the same time surviving. The risk of deterioration of loan portfolios, MFI liquidity levels and the ability of borrowers to repay loans threatens many MFIs solvency and will determine their ability to survive the pandemic. Other aspect is the reduction of lending levels and its impact on low-income clients who depend on microfinance for their livelihood. In addition, during the last year and a half lockdowns, a big part of the vulnerable population has been forced to embrace new digital technologies. This new situation presents opportunities and challenges because there is the risk of not using financial products in a correct way.

We can say that the microfinance sector is under a great pressure but the Pandemic represents a unique opportunity to invest in digital inclusion. Digital technologies will play an important role in accelerating the economic recovery of the most vulnerable population. This can only be accomplished if governments and private sector work together to help the unbanked reduce their digital breach.

The contributions of this dissertation can be classified for practitioners, academics and institutions. For practitioners, the use ICTs must be further incorporated in MFIs daily activities. Starting with front line officers contacts with beneficiaries from the initial stages of risk evaluation, monthly meetings management, on-line training, and more important for impact assessment. In addition the risk of over indebtedness and the relevant factors that can affect default rates have been identified. For academics, cooperation among different research centres in developing digital financial education to be used in developing countries and the information provided by mobile platforms could be a starting point for impact assessment and further quantitative research. For institutions, we suggest public-private collaboration among all the involved actors, such as government, NPOs and development organizations that should work together to provide the necessary framework for increasing stability and integrity of financial institutions and protection of the more vulnerable. Cooperation among the different actors is the only way to achieve economic growth in a sustainable and inclusive way. There is a credible possibility of a new era of innovation that could raise living standards, especially if all actors cooperate to promote investments in digital technologies and education for the more vulnerable population.

No study is without limitations. First, the generalization of our findings is restricted by our focus on Peru and Ecuador. These results should, of course, be interpreted with caution, as they may be idiosyncratic of the period and region. A second, potential limitation is that the gathered information was at one point in time, whereas the technology and MFIs evolution is a dynamic process. Finally, we have focused on financial education and ICT but there are other factors that can affect MFIs' impact on the more vulnerable. Trust in the institutions, regulatory environment, modern infrastructure and communications, are other conditions that play a key role in improving financial inclusion.

In line with these results, as futures research lines, we have decided to start a new project consisting in producing short educational videos focused on women entrepreneurs in developing countries. We have seen in the previous chapters that financial education is key for micro entrepreneurs success and that financial education must be simple and practical. Many experiments showed that the use of video or audio media technology for financial literacy could have a positive impact. These videos are mainly targeted to woman in rural areas starting a new business. The videos use a colloquial language and are easy to understand. Regarding the content it must be flexible and have to be adapted the specific needs of the beneficiaries. The first collection called "Clothes for growth", have already been registered in "Registro Territorial de la Propiedad Intelectual", 05 February 2021, M-000774/2021. These videos introduce basic accounting concepts such as: differentiating between family and businesses accounts, recording transactions, collections and payments, the importance of savings, loan use, differentiate investment from expenses, how to calculate the cost of products, and other topics such as over indebtedness and interest rates. You can find bellow an example of a video of a woman starting a business and not knowing how to handle her accounts.

Other future research lines include the design of a complete savings groups credit scoring and the evaluation of the impact of the pandemic on savings group's defaults.

Finally, financial inclusion is a complex field but the present results legitimize the author to continue exploring on this area. There is a need for more collaboration between researchers and practitioners that can assist the most vulnerable population to achieve economic growth in a sustainable and inclusive way.

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Annexes

Annex 2.1 Interviewers technical sheet

Annex 2.2 Semi-structured interviews outline

Annex 3.1 Case Study: Clothes for growth

Annex 3.2 Cash Flow templates

Annex 3.2 Student Questionnaire

Annex 2.1 Interviewers technical sheet

CODE	Organization/ Position	Country/ City	Typology	Time	Number of meetings	Main issue
	Mi Banco - MFI (Peru)					
1	General Manager of Economic Studies	Peru/Lima	Meeting Face to face	2 hours	1	Front line officers & customer retention
	Financiera Confianza SA - MFI (Peru)					
2	General Manager.	Peru/Lima	Business Lunch	2 hours	1	MFIs Sustainability
3	Deputy General Manager of Legal Services.	Peru/Lima	Meeting Face to face	2 hours	1	MFIs Sustainability
4	Deputy General Manager of Economic Studies.	Peru/Lima	Meeting Face to face	6 hours	3	Financial Education & Front-line offices
5	Regional Manager for Lima, at the San Juan de Lurigancho	Lima Area/Peru	Meeting Face to face	3 hours	1	Risk assessment & customer retention
6	Administrator at San Juan Próceres Branch	Lima Area/Peru	Meeting Face to face	4 hours	1	Customer relation & Front Officers
	Financiera Confianza (FC) Customers					
7	Customer 1- Motor bicycle taxi	Peru/ Lima area	Visit to premises	2 hours	1	Long term relationship with FC
8	Customer 2. Retail shop and Taylor made clothes	Peru/ Lima area	Visit to premises	2 hours	1	Credit application and Financial training
9	Customer 3. Shoe repair shop	Peru/ Lima area	Visit to premises	2 hours	1	Formal and informal Accounting
	ADRA (Peru)					
10	Administration and Finance Director	Peru/Lima	Meeting Face to face	2 hours	1	Woman Group Lending
	Banco de la Nación, Peru					
11	Technology general manager	Peru/Lima	Business Lunch	2 hours	1	ICT
	CEFI-ASBAN					
12	Education and Financial Inclusion Co-ordinators.	Peru/Lima	Meeting Face to face	2 hours	1	CCT- Financial Education
13	Education and Financial Inclusion Co-ordinators.	Peru/Lima	Meeting Face to face	2 hours	1	Financial Education material
	COPEME Peru					
14	General Manager	Peru/Lima	Meeting	2	1	Public policy

			Face to face	hours		and financial education
15	Assistant Manager	Peru/Lima	Meeting Face to face	2 hours	1	ICT & Risk assessment
	ASOMIF, Peru					
16	General Manager.	Peru/Lima	Meeting Face to face	2 hours	1	Public policy and financial education
	FMBBVA, Madrid					
17	Board Member BBVAMF	Spain/Madrid	Meeting Face to face	6 hours	3	Corporate Governance and MFI sustainability
18	Impact assessment manager	Spain/Madrid	Meeting Face to face	4 hours	2	Impact assessment
19	Impact assessment manager	Spain/Madrid	Meeting Face to face	2 hours	1	Impact assessment
20	**CODESPA**					
20	Country Manager Peru	Peru/Lima	Meeting Face to face	2 hours	1	Inclusive tourism-Financial Skills
21	Director Impact Evaluation, Madrid	Spain/Madrid	Meeting Face to face	2 hours	1	Savings groups- Impact assessment
	FUNDACIÓN AFI, Madrid					
22	Director Fundación AFI	Spain/Madrid	Meeting Face to face	2 hours	1	ICT
23	Founding Partner	Spain/Madrid	Meeting Face to face	6 hours	3	Social responsibility
24	ICT Support	Spain/Madrid	Meeting Face to face	8 hours	4	ICT
25	Country Manager Ecuador	Spain/Madrid	Meeting Face to face	2 hours	1	Savings Group Management
	Acción Emprendedora (NPO)					
26	Founding Partner	Peru/Lima	Meeting Face to face	2 hours	1	Entrepreneurship
	ESAN University Peru					
27	Vice Dean	Peru/Lima	Meeting Face to face	3 hours	2	Project Pro-mujer
28	Professor of ICT	Peru/Lima	Meeting Face to face	2 hours	1	ICT
29	Professor	Peru/Lima	Telephone conversation	2 hours	1	Social responsibility

Annex 2.2 Semi-structured interviews outline

To Customers

- Type of business. Activity, sector, volume of sales

- Is it a family business? How many members of the family work in the company?

- Is the business generating profits? Is it the first source of income for your family?

- How many years have you been working with Financiera Confianza?

- What is the size of your loan, repayment period, and interest rate, size of its regular re-payments?

- Do you have any other loan with other formal or informal institution?

- What is your level of education? Have you received recently any financial or accounting education? Other type of training?

- Do you differentiate your family accounts from the business accounts?

- How do you record your transactions?

- Do you know how to do your credit application?

- Do you have a Personal Computer

- Do you use your Mobile phone for transferring money or other banking transactions

- Name some ITC innovations that you are using so far that has impacted you daily work

Annex 3.1 Case Study: Clothes for growth[7]

Mrs. Lucy is married and has two daughters. She lives in a remote rural area in the state of Piura (Peru). She attended primary school and when married she left her studies. However, she has decided that she wants to give her daughters a better education. Her husband works in agriculture and gives her a small amount of money for the daily needs, 100 soles per week. Nevertheless this amount of money is not enough to cover the minimum needs.

She has an old sewing machine, and years of experience in designing and sewing. She has done all her life her own clothes. Occasionally she has also done new dresses and repairs for neighbors and friends. Giving that the girls had grown up and she has more time, she has decided to start a new business at home. The first thing she is going to do is to separate accounts from the home and the business in order to know if she is making enough profit with the business.

She has been saving money during the last few years, keeping it in a box in the cupboard and decided to invest her life savings of 300 soles in a new business.

During the first few months of operations she has been paying and collecting money, without differentiating between family and business areas. Additionally, she has no financial education neither any accounting knowledge, but she is a very organized person and has been written in a notebook a list of the transactions she has made in the last few weeks. Can we help her to make a cash-flow statement for these periods differentiating between family and business accounts?

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[7] Ilustraciones Sunidella@

Week 1

1. At the beginning of the week 1 she has at home 200 soles in cash.
2. In addition, she has been saving money during the last few years and decided to invest her life savings of 300 soles in the new business.
3. She buys food in the local grocery for 90 soles.
4. One of her daughters got ill and she paid 70 soles for the doctor visit and medicines.
5. She has bought material of 35 meters at 4,5 soles/meter. Se estimated that each dress takes 3 meters of fabric.
6. Her husband give her a contribution of 100 soles a week for the daily home expenses
7. The girls need new clothes and material for school. She bought two trousers and two shirts for 50 soles and some books, pencils and paper for 20 soles.

Week 2

1. She sells the first dress for 25 soles.
2. She buys food in the local grocery for 50 soles.
3. One week a month there is a special vegetable market in the area and she like to buy fresh products, this time she bought different fresh vegetables for 15 soles.
4. Her daughter is still ill and the local doctor recommended her to go to the nearest village for x-rays. She had to pay 30 soles for the transport and x-ray
5. Next week is her husband birthday and she is planning to organize a party at home for all her family. She bought special food and drinks for 70 soles

Week 3

1. During the first few weeks she has been working by herself but she has an increasing number of orders that she cannot manage. Thus, she has hired a young niece Ms. Dolly who has learned quickly and is showing a great enthusiasm and motivation. They agreed to pay a variable salary consisting on 5 soles per dress sold.

2. She sells 3 dresses at 25 soles each.
3. She buys food for 25 soles.

4. This week is her husband party so she went to the hairdresser and paid 5 soles.
5. She has paid her niece the corresponding salary consisting in 15 soles (5 soles * 3 dresses)

Week 4

1. She pays the home electricity bill of two months of 100 soles.
2. She pays the home water bill of the month for 50 soles.
3. She sells 5 dresses at 25 soles per dress.
4. She has contracted for the business Mobil calls and Internet with a new phone company in the area and agreed to pay a fix amount of 100 soles a month. The first bill is paid in week 4 and every month in week 8 and 12.
5. Giving that she has not got enough money to attend all the family needs Mrs Lucy has decided to pay herself a salary of 50 soles a week.
6. She buys food for 30 soles.
7. She has paid her niece the corresponding salary.

Week 5

1. The business is going well, so he has decided to buy a second hand sewing machine for her niece for 200 soles.
2. She is having problems to meet her daily payments and took a 20-month loan of 1.200 soles from a local lender with an annual linear interest rate of 50%. She pays interest expenses monthly and repays the principal also monthly in 20 months. It is say; she will repay principal of 60 soles a month starting in week 8, week 12… and monthly interest of the remaining capital. First month: 1.200 * 50%/12= 50 soles, second Month: (1.200-60)*50%/12= 47,5.
3. She decided to increase the price for dresses to 30 soles. She sells 1 dress for 30 soles.
4. The girls need new material for school. She paid 30 soles.
6. Mrs. Lucy has decided to make also shirts form men and buys 40 meters of shirt fabric for 4 soles per meter. She knows that each shirt take 2 meters of material, therefore she expects to make 20 shirts with this material.
7. She has decided to pay her niece Dolly 3 soles per shirt.
5. Mrs. Lucy buys another 30 meters of material for dresses and she has negotiated with the supplier to get a discount because she is paying cash so she will be paying 4 soles per meter.
6. This week she has sold also 2 shirts for 20 soles each
7. She buys food for 50 soles.
8. She has paid her niece the corresponding salary of 11 soles (1 dress* 5 soles and 2 shirts*3 soles).

Week 6

1. The sewing machine broke down; the repair cost was 20 soles. The repair shop proposed Mrs. Lucy a weekly maintenance contract of 1 sol/week and she has accepted starting in week 7.
2. She sells 2 dresses for 30 soles each and 2 shirts 20 soles each.
3. She went to the doctor and pay 10 soles.
4. She has paid her niece the corresponding salary.
5. In the special vegetable market, she bought vegetables for 15 soles.
6. She buys food for 45 soles.
7. This time of the year is the raining season. The past two weeks it has been raining a lot in their village. The roof of the house has been heavy damage and need to be repaired immediately. The constructor has budgeted a cost of 300 soles but agree to be paid during the next 3 weeks, 100 soles per week, week 6, week 7 and week 8.
8. She decided to transfer part of the loan with no interest to the family to pay the roof. She transferred 400 soles.

Week 7

1. She sells 4 dresses for 30 soles each and 5 shirts for 20 soles each.
2. Mrs. Lucy and Dolly have been working at home but Lucy´s husband has complained that the place is very small for the family and the business. So Mrs. Lucy decided to rent a place nearby. The new place rent expense amounted 40 soles per week, starting week 7. His husband has helped her to move all the materials and furniture to the new place
3. Mrs. Lucy had to refurnish the new place, so she bought four chairs, a long table, and a cupboard. She agreed with the supplier to pay him 50% in week 8 and the rest on week 10. The total cost of the furniture was 250 soles.
4. She buys food for 50 soles.
5. She has paid her niece the corresponding salary.

Week 8

1. She sells 4 dresses for 30 soles and 2 shirts for 20 soles each.
2. In addition to the rent of the new place she will have to pay electricity. For the moment, the landlord asked her to pay additionally 10 soles every week for electricity and water. Starting in week 8.
3. She buys food for 35 soles
4. She pays home water of the month for 45 soles.
5. She has paid her niece the corresponding salary.
6. She pays the interest on the loan (1.200 soles *5%/12= 50 soles) and repay principal of 60 soles (1.200 soles / 20 months)
7. She thinks the business is doing well and has decided to make a big party and invite her family that lives in a small village close by and some of her neighbors. The celebration cost her 100 soles.
8. She pays the monthly phone and Internet bill for the business (100 soles).

Week 9

1. She decided to increase the price for shirts to 25 soles each.
2. She has bought 46 meters of a new dress material for 4 soles/meter and 20 meters of shirt material for 4 soles per meter
3. She sells 3 dresses for 30 soles each and 5 shirts by 25 soles each.
4. She buys food for 35 soles and cleaning products for 20 soles
5. Her husband has an accident when coming back home and will not be able to work in the next 4 weeks. That means he will not be able to give his wife the full home contribution during some weeks. His new allowance is 50 soles from week 9 to 12. He went to the doctor and paid 70 soles.
6. She has paid her niece the corresponding salary.

Week 10

1. She sells 4 dresses at 30 soles each and 4 shirts at 25 soles each.
2. She accepted a special order. She is doing a wedding dress for one of her niece, for a price of 200 soles. She bought 10 meters of white silk material to a local supplier at a cost of 8 soles per meter.
3. She buys food for 40 soles.
4. The girls need new material for school. She paid 40 soles.
5. In the monthly special vegetable market, she bought vegetables for 18 soles.
6. She has paid her niece the corresponding salary, except for the special order.

Week 11

1. She sells 5 dresses at 30 soles each and 4 shirts at 25 soles each.
2. She buys food in the grocery for 45 soles.
3. She has paid her niece the corresponding salary.

Week 12

1. She sells 5 dresses at 30 soles each and 5 shirts at 25 soles each.

2. She buys food for 35 soles.
3. She pays the home water of the month for 50 soles.
4. She pays the interest on the loan (1.140*50%/12=47,5 soles) and repay 60 euros of the principal.
5. She has paid her niece the corresponding salary and a bonus of 10 soles for the extra hours in helping her with the wedding dress
6. All the family is going to the wedding and need new clothes. She design and made 3 special event dresses. She bought 12 meters of a special colorful fabric for 7 soles per meter, and paid cash. She used all the fabric in the 3 dresses
7. She pays the home electricity of two months: 180 soles
8. She gave her niece a wedding gift consisting in 70 soles.
9. She pays the monthly phone and Internet bill for the business.

IT IS REQUIRED

1) Help Mrs. Lucy to Know to prepare a monthly cash flow for her business and for the home. Differentiate the Cash-flow from operating, investing and financial decisions
   a. How much money has she left at home at the end of month 1, 2 and 3
   b. How much cash has the business produced at the end of month 1, 2 and 3?
   c. Prepare an inventory control table in units of material. How much material is left at the end of month 1, 2 and 3? Differentiate between material for dresses and material for shirts.
   d. Which is the loan outstanding at the end of month 2 and 3
2) Based on the produced information, which are the key aspects of Mrs. Lucy business?

Annex 3.2 Cash Flow templates

Familly Cash-Flow Records

	week1	week2	week3	week4	MONTH 1
Initial cash		-	-	-	-
Family/revenues	-	-	-	-	-
Salary member 1- Husband contribution					-
Salary wife					-
Familly Expenses	-	-	-	-	-
Food and Cleaning materials					-
Health					-
Clothes					-
School					-
Celebrations					-
Hair dresser					-
Others- Vegetable market					-
Electricity					-
Water					-
I- CF from Operations	-	-	-	-	-
II- Captial investment	-	-	-	-	-
Roof repair					
Furniture					
Others					
III- Financial resources	-	-	-	-	-
Loan from business					
Dividends					
Other extrordinary resoruces					
Total Familly CASH at the end	-	-	-	-	-

Business Cash-Flow Records

	week1	week2	week3	week4	MONTH 1
Initial cash		-	-	-	-
Collections from sales	-	-	-	-	-
Sales product 1 -Dress	-				-
Units Product 1					-
Price product 1					-
Sales product 2-Shirts	-	-	-	-	
Units Product 2					
Price product 2					
Sales product 3	-	-	-	-	
Units Product 3					
Price product 3					
Sales product 4	-	-	-	-	
Units Product 4					
Price product 4					
Other income/collections					
Payments					
Total raw material	-	-	-	-	-
Cost raw material 1					-
Units RM 1					-
Cost RM 1 per unit					
Cost raw material 2					-
Units RM 2					-
Cost RM2 per unit					
Cost raw material 3					
Units RM 3					
Cost RM 3 per unit					
Salaries					-
Salary owner					-
Salary employee 1-Niece					-
Salary employee 2					-
Salary employee 3					-
Supplies and others					-
Rent					-
Other utilities					-
Phone and interent					-
Repairs and maintenance					-
Extraordinary events					-
I- CF from Operations	-	-	-	-	-

	week1	week2	week3	week4	MONTH 1
II- Captial investment	-	-	-	-	-
Machinery					
Furniture					
Others					
III- Financial resources	-	-	-	-	-
EQUITY (Savings)					-
Loan to familly					
New Loan					
Repayment of loan 1					
Interest on loan					
Total Business CASH at the end	-	-	-	-	-

Loan Information

	week1	week2	week3	week4	MONTH 1
Loan information					
Loan initial					
Num.months					
Repayment of loan					
Interest on loan					
Loan outstanding Balance					

Inventory control   3

Fabrics *in meters*	**For dresses (3 metres per unit)**		
	month 1	**month 2**	**month 3**
Begining Inventory	-	-	-
Fabric purchase	-	-	-
Fabric Used	-	-	-
Ending Inventory	-	-	-

Fabrics *in merers*	**For shirts (2 metres per unit)**		
	month 1	**month 2**	**month 3**
Begining Inventory	-	-	-
Fabric purchase	-	-	-
Fabric Used	-	-	-
Ending Inventory	-	-	-

Annex 3.3 Student Questionnaire

Student Questionnaire Case Study: Clothes for growth
FAMILY NAME……………………………………………… NAME………………………………………………………
DATE………………………………………………………. UNIVERSITY………………………………………………

Please answer the following questions:

PART I

1. Age			
2. Gender		Male	Female
3. Do you have any labor experience? Indicate in months.			
4. How many years of higher education have you studied?			
5. Indicate your average final grade of last year.			
6. Indicate what degree you are currently doing	Business & Economics	Business & Law	Business & IIRR

PART II

Help Mrs. Lucy to Know to prepare a monthly cash flow for her business and for the home. Differentiate the Cash-flow from operating, investing and financial decisions.

	End of month 1 (3 points)	End of month 2 (3 points)	End of month 3 (3 points)
a) How much money has Miss Lucy left at home?			
b) How much cash has the business produce?			
c) How much material (dresses) is left at the end of the month?			
d) How much material (shirts) is left at the end of the month?			
e) After week 12 how much of the loan is outstanding? (1 point)			

PART III. Please value the following questions measured on a five-point Likert-type scale (from 1 = do not agree, to 5 = completely agree)

1. Indicate which is your interest in starting a new business. (X1.ENTRE)	1	2	3	4	5
2. Do you find this exercise useful if you´re planning to start a new business? (X2.USFL)	1	2	3	4	5
3. Do you come from an entrepreneurial family? (X3.ENTRFA)	1	2	3	4	5
4. Indicate the difficulty of this exercise. (X4.DIFF)	1	2	3	4	5
5. Was the template useful?	1	2	3	4	5
6. Overall, did you understand the exercise? (X6. UNDERS)	1	2	3	4	5
7. How do you value your level of financial education? (X7.FINED)	1	2	3	4	5
8. How long did it take you to solve the problem? (in minutes)					