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Microfinance - Poverty Alleviation and Women's Empowerment: Evidence from a Cameroonian village bank, the *Mutuelles Communautaires de Croissance* (MC^2)

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Abstract

Within the last two decades, the microfinance movement has reached millions of poor people. However, the debate about the outcome of microcredit on the poor remains controversial. This dissertation uses a panel data set from Western Cameroon to provide evidence on the potential benefits of microfinance –namely the impact of microcredit on household income, measured by average per-capita income in the household. The panel data analysis presented in this work covers three points in time –that is 2002, 2004 and 2011. This research also analyzes the theoretical effect of microcredit on income of agricultural households through an economic model tailored to agricultural households. We focus the theoretical discussion on agricultural households for two reasons: (1) almost 40% of the population in Cameroon are extreme poor and these poor live mostly in rural areas and are largely dependent on agriculture; (2) almost 100% of our sample constitute rural households with agriculture being either their first or second activity.

The overall research questions are: How robust is the evidence that access to microcredit reduces household poverty? If microcredit empowers married women, what are its consequences on them at the household level?

Our general hypothesis is that microcredit has a significant positive impact on household income. We tested the hypothesis empirically for households from Western Cameroon which either had access to credit (treatment group) or not (control group) from a village bank named *Mutuelles Communautaires de Croissance* (MC^2).

The results revealed that microcredit has had a significant and positive impact on per capita income for the first two periods (2002 and 2004) but not in 2011 (as compared to 2002 and 2004). The control group (group without credit) was better off than the treatment group (group with credit). The results were robust even after controlling for the difference in income before and after the microcredit intervention in the treatment and the control group using the *Difference-in-Difference matching* method. Nevertheless, absolute poverty had decreased in the panel group too, however, not as much as in the control group. Then we controlled for the use of microcredits and we found that in 2011, treatment households used their microcredit not only for income creating farm and non-farm activities. The same microcredit is often split up between income creating activities and issues addressed as consumptive, such as paying for children's education, health care and others − namely food consumption, funerals, household assets, etc. We concluded,

taking other findings into account too, that the treatment group had used the microcredit for purposes other than income creating activities, thus falling back over the time in comparison to the control group. If the microcredit is used for a purpose other than the ones supported by the microfinance institutions, we cannot see its impact on household income and for this reason. Yet, we cannot conclude that the microcredit does not have a positive impact. Its impact on other relevant outcome factors should be considered.

Additionally, using qualitative data at one point in time in 2012, this work also investigates the impact of microcredit on women's empowerment and discusses the family challenges that particularly married women face with the microcredit. The hypotheses are:

- Microcredit contributes to increasing women's decision making ability regarding their activities.
- Microcredit allows women to have control over the use of income.
- Married women face new family challenges after having received microcredit.

The finding suggested that microcredit has a significant positive impact on women's empowerment by improving their economic situation and offers them potentially the capability of making decisions that can positively affect their lives and their futures and therefore their well-being. But access to microcredit can give more power to women within the household that might go against the cultural and social norms and hence creating tension, and conflict at the household level. Therefore rethinking on how to increase the beneficial effects of microcredit on married women; create an environment for them without violence and conflict; and improve the image of rural women by helping them to become equal partners in decision making at household level needs serious attention.

Zusammenfassung

In den letzten zwei Jahrzehnten hat die sogenannte Mikrofinanzbewegung Millionen armer Menschen erreicht. Jedoch bleibt die Debatte über das Ergebnis von Kleinkrediten für die Armen kontrovers. Diese Dissertation verwendet Paneldaten aus dem westlichen Kamerun, um Hinweise auf den möglichen Nutzen von Mikrofinanzdienstleistungen zu liefern, insbesondere die Auswirkung von Kleinkrediten auf das Haushaltseinkommen. Die Panel-Daten-Analyse, die in dieser Arbeit verwendet wird, umfasst drei Zeitpunkten: 2002, 2004 und 2011. Diese Arbeit präsentiert und diskutiert auch die theoretische Wirkung von Kleinkredit auf das Einkommen der landwirtschaftlichen Haushalte durch ein ökonomisches Modell, das auf landwirtschaftliche Haushalte zugeschnitten ist. Wir konzentrieren uns auf die theoretische Diskussion von landwirtschaftlichen Haushalte aus zwei Gründen: (1) fast 40 % der Bevölkerung in Kamerun sind extrem arm und diese Armen wohnen meistens auf dem Land und sind von der Landwirtschaft wirtschaftlich abhängig; (2) fast 100 % unserer Stichprobe lebt von der Landwirtschaft, entweder als erste oder zweite ökonomische Aktivität.

Die Arbeit behandelt die folgenden Forschungsfragen: (1) hat der Zugang zu Kleinkrediten einen Einfluss auf die Armutsreduzierung und wie robust ist dies Effekt. (2) Insofern der Zugang zu Kleinkrediten einen positiven Effekt auf die Autonomie von verheirateten Frauen hat, was sind die konkreten Konsequenzen innerhalb der Haushalte?

Die Hypothese lautet, dass Kleinkredit eine signifikante Auswirkung auf das Haushaltseinkommen hat. Die Hypothese wurde empirisch für ländliche Haushalte in Westkamerun getestet, die entweder Zugang zu Kleinkrediten von einer Dorfbank namens *Mutuelles Communautaires de Croissance* (MC^2) hatten (Treatment-Gruppe) oder nicht (Vergleichsgruppe).

Die Ergebnisse der Auswertung zeigen, dass Kleinkredit einen signifikanten und positiven Einfluss auf das Pro-Kopf-Einkommen der landwirtschaftlichen Haushalte in den ersten beiden Perioden (2002 und 2004) hatte. Aber im Jahr 2011 (im Vergleich zu 2002 und 2004), konnte kein signifikanter Effekt mehr beobachtet werden. Das Einkommen der Vergleichsgruppe (Gruppe ohne Kredit) war höher als das der Treatment-Gruppe (Gruppe mit Kredit). Die Ergebnisse blieben auch robust nach der Auswertung der Einkommensdifferenz vor und nach der Kleinkreditintervention in den beiden Gruppen unter Verwendung der *Difference-in-Difference* matching Methode. Dennoch hat sich die absolute Armut in beiden Gruppen im Laufe der Zeit verringert, in

der Vergleichsgruppe jedoch stärker als in der Treatment-Gruppe. Aus diesem Grunde haben wir die Kreditverwendung näher beleuchtet und gefunden, dass die Treatment-Gruppe den Kredit im Jahr 2011 nicht nur für landwirtschaftliche und außer-landwirtschaftliche einkommensgenerierende Aktivitäten verwendet haben sondern auch sogenannte konsumtive Zwecke. Dazu gehören beispielsweise Kredit-finanzierte Ausgaben für die Schulbildung der Kinder, Gesundheitsversorgung, Nahrungsmittelverbrauch, oder Begräbnisse. Wir sind zu dem Schluss gekommen, dass die Treatment-Gruppe den einkommensschaffenden Effekt des Kleinkredits abgeschwächt hat. Nichts desto trotz kann daraus nicht der Schluss gezogen werden, dass der Kleinkredit sich nicht positiv ausgewirkt hat. Seine Auswirkung auf andere wohlfahrtsrelevante Ergebnisse sollte in die Beurteilung mit einbezogen werden.

Darüber hinaus hat diese Dissertation auch die Auswirkung von Kleinkredit auf die Autonomie der Frauen mit den qualitativen Daten aus dem Jahr 2012 bewertet, und bespricht die Herausforderungen, denen sich insbesondere verheiratete Frauen, die Zugang zu Kleinkrediten haben, ausgesetzt sehen. Die Hypothesen sind:

- Kleinkredit erhöht die selbstbestimmte Entscheidungsfähigkeit von Frauen in Bezug auf ihre Aktivitäten.
- Kleinkredit ermöglicht es Frauen, die Kontrolle über die Verwendung des damit erzielten Einkommens zu haben.
- Der Erhalt von Kleinkredit setzt verheiratete Frauen vor neue Herausforderungen.

Das Ergebnis ist, dass Kleinkredit eine signifikante Auswirkung auf die Autonomie der Frauen hat. Der Zugang zu Kleinkredit verbessert die wirtschaftliche Situation von Frauen und bietet ihnen möglicherweise die Fähigkeit, selbstbestimmte Entscheidungen zu treffen, die ihr Leben und ihre Zukunft positiv beeinflussen können und daher ihr Wohlbefinden. Dagegen spricht, dass der Zugang zu Kleinkredit von Frauen durch die Ehemänner mit mehr Macht im Haushalt assoziiert wird. Dies widerspricht kulturellen und sozialen Normen und kann daher zu Gewalt und Konflikten auf der Haushaltsebene führen. Deshalb sollte weiter überlegt werden, wie man die wohltuende Wirkung von Kleinkredit auf verheiratete Frauen erhöhen kann, wie Gewalt und Konflikt im Zusammenhang mit Kreditinterventionen für Frauen vermieden werden kann, und wie gleichzeitig das Image der Frauen in ländlichen Gebieten verbessert werden kann, indem sie zu gleichberechtigten Partnern in der Entscheidung auf Haushaltsebene werden.

Resumé

Au cours des deux dernières décennies, la microfinance a atteint des millions de personnes pauvres exclues des banques traditionnelles. Cependant, le débat sur l'impact de ce mouvement reste controversé. Cette thèse évalue le rôle économique et social que joue la microfinance en mettant en évidence l'impact du microcrédit sur le revenu des pauvres, et ce à l'aide des données de panel provenant de l'Ouest Cameroun. Pendant que les recherches empiriques sont menées sur ce sujet particulièrement en utilisant les données longitudinales, ces données de panels sont relativement peu fréquentes pour les pays Africains. L'analyse des données de panel présentée dans le cadre de notre étude couvre trois périodes, à savoir 2002, 2004 et 2011. Cette recherche a également analysé l'effet théorique du microcrédit sur le revenu des ménages agricoles par le biais d'un modèle économique: le modèle des ménages agricoles. Une importance a été accordée sur ce modèle pour deux raisons : (1) au Cameroun près de 40 % de la population sont extrêmement pauvres et ces pauvres résident en majorité dans la zone rurale et dépendent largement de l'agriculture. (2) près que 100 % de notre échantillon est constitué des ménages ayant l'agriculture soit comme activité principale ou secondaire.

Les questions majeures de cette recherche sont les suivantes: quelle est la robustesse de l'évidence que l'accès au microcrédit réduit la pauvreté ? En d'autres termes, la preuve que l'accès au microcrédit réduit la pauvreté est-elle solidement établie ? Si l'accès au microcrédit a un impact positif sur l'autonomie des femmes mariées, quelles sont ses conséquences au sein de leurs ménages ?

Notre hypothèse est la suivante: le microcrédit a un impact significatif sur le revenu des ménages. Pour vérifier cette hypothèse, nous l'avons empiriquement testé avec les ménages ayant ou non reçu du crédit de la microfinance appelée *les Mutuelles Communautaires de Croissance* (MC^2) dans la région de l'Ouest Cameroun. Les ménages (clients) ayant déjà reçu du crédit sont appelés groupe de traitement et ceux n'ayant pas encore obtenu du crédit sont considérés comme groupe témoin.

Les résultats de cette évaluation montrent que la microfinance, plus spécifiquement le microcrédit a eu un impact significatif sur le revenu (par habitant) des ménages en 2002 et 2004. Mais en 2011 (par rapport à 2002 et 2004), cet impact positif n'est plus observé. Le groupe témoin (groupe n'ayant pas reçu du crédit) présente un niveau de revenu plus élevé que celui du groupe de traitement (groupe ayant reçu du crédit). Les résultats restent robustes même en contrôlant la différence de revenu avant et après

l'intervention du programme de microcrédit entre les deux groupes, et ce à l'aide de la méthode de *Difference-in-Difference matching*. Néanmoins, l'extrême pauvreté a relativement diminué avec le temps pour les deux groups, mais pas autant chez le groupe témoin. Ensuite nous avons contrôlé l'utilisation du microcrédit par les ménages et les résultats révèlent qu'en 2011, le crédit n'a pas été seulement utilisé pour l'activité qui génère le revenu. Le même crédit est fractionné entre l'activité exercée par le ménage, les soins de santé, la scolarité des enfants et autres-à savoir: la consommation alimentaire, les dépenses pour de funérailles, l'équipement du ménage, etc. La conclusion tirée de cette analyse est que si le crédit est utilisé à des fins autres que l'activité exercée par le ménage, il est difficile que cela ait un impact positif sur le revenu de ce dernier. Dans le cas d'espèce, le crédit a été dévié de son objectif initial, et pour cette raison, nous ne pouvons pas affirmer qu'il n'a pas d'impact positif. Il est donc nécessaire de considérer son impact sur le bienêtre général du ménage.

En outre, cette étude a également évalué l'impact du microcrédit sur l'autonomie de la femme en utilisant les données qualitatives de 2012 et a mis cependant l'accent sur les problèmes auxquels sont confrontées les femmes mariées avec le microcrédit. Les hypothèses sont les suivantes :

- Le microcrédit contribue à une amélioration du statut économique des femmes et leur offre la capacité de prendre des décisions sur leurs activités, d'avoir le contrôle sur l'utilisation de leur revenu.
- Les femmes mariées sont confrontées à des nouveaux défis familiaux avec l'accès au crédit.

Les résultats indiquent que le microcrédit a un impact significatif sur l'autonomie de la femme. L'accès au microcrédit améliore la situation économique des femmes et leur offre la capacité de prendre des décisions qui peuvent positivement affecter leur vie et leur future, et donc leur bien- être. Mais l'accès au microcrédit peut donner plus de pouvoir aux femmes au sein de leurs ménages qui va à l'encontre des normes culturelles et sociales, et créant ainsi des tensions et conflits au sein de leurs ménages. Cependant, repensez à une amélioration des effets bénéfiques du microcrédit chez les femmes mariées, à la création d'un environnement sans violence et conflit au sein de leurs ménages, et à une amélioration de l'image de la femme rurale en l'aidant à devenir des partenaires égaux dans la prise de décision au sein leur ménage nécessite une attention particulière.

Preface

Within the last two decades, the microfinance movement has reached millions of poor people all over the world. However, the debate about the outcome of microfinance services, particularly microcredit remains controversial.

This dissertation uses a panel dataset from Western Cameroon to provide evidence of the potential benefits of microfinance – namely the impact of microcredit on household income. The panel dataset differentiates between a so-called treatment group (with microcredit) and a control group. The panel data analysis presented in this work covers three points in time: 2002, 2004 and 2011. With regard to the data, Djeudja (2006) provided the first two survey rounds; this is very much appreciated and depicts ideal scientific cooperation.

The dissertation could show that microcredit has had a significant positive impact on per capita income for the first two periods (from 2002 until 2004) but in 2011 (as compared to 2002), it could not anymore find a significant impact. The result was robust even after controlling for the difference in income before and after the microcredit intervention in the treatment and the control group. Notwithstanding, poverty had decreased in the treatment group too, however, not as much as in the control group. The explanation was, taking other findings into account too, that the treatment group had used the microcredit for purposes other than income creating activities, thus presumably falling back over time in comparison to the control group.

Nevertheless, the microcredit service is highly in demand, especially since it is offered at competitive interest rates as compared to informal providers of microcredit as well as it is given timely and adapted to the living conditions of the poorer target groups as compared to the formal providers such as commercial banks. Therefore, as long as we accept the economic premise that individuals know best about their demand and preference structure, we have to acknowledge the possibility that the treatment group benefitted from the fact that it had access to microcredit, even if the income of this group was comparably lower than the one of the control group in 2011.

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Acronyms

ACEP	Agence de Crédit pour l'Entreprise Privée du Cameroun
ADAF	Appropriate Development for Africa Foundation
ANEMCAM	Association Nationale des Etablissements de Microfinance du Cameroun
ATT	Average treatment effect on the treated
BEAC	Banque des Etats de l'Afrique Centrale
BCEAO	Banque Centrale des Etats de l'Afrique de l'Ouest
BCD	Banque Camerounaise de Développement
BICEC	Banque Internationale du Cameroun pour l'Epargne et le Crédit
BCEAEC	Banque Centrale des Etats de l'Afrique Equatoriale et du Cameroun
CVECA	Caisses Villageoises d'Epargne et de Crédit Autogérées
CGAP	Consultative Group to Assist the Poor
CEMAC	Communauté Economique et Monétaire de l'Afrique Centrale
CAC	Crédit Agricole du Cameroun
COBAC	Commission Bancaire de l'Afrique Centrale
COFINEST	Compagnie Financière de l'Estuaire
CCEI Bank	Caisse Commune d'Epargne et d'Investissement
CAPCOL	Caisse Populaire Coopérative du Littoral
DID	Difference-in-difference method
FAO	Food and Agriculture Organization
FIFFA	First Investment For Financial Assistance
EED	Church Development Service
CamCCUL	Cameroon Cooperative Credit Union League
COOP/GIC	Coopératives et groupements d'initiative commune
FONADER	Fonds National de Développement Rural
Franc CFA	Financial Cooperation in Africa
GESP	Growth and Employment Strategy Paper
GIZ	Gesellschaft für Internationale Zusammenarbeit
GBF	Goldy Bussinessmen Fund
GDP	Gross Domestic Product
GNP	Gross National Product
GIC	Groupe d'Initiative Commune

HH	Household
HIPC	Heavily Indebted Poor Countries
HDI	Human Development Index
IFAD	International Fund for Agricultural and Development
IV	Instrumental variable methods
ILO	International Labor Organization
IMF	International Monetary Fund
IFPRI	International Food policy research Institute
MC^2	Mutuelle Communautaire de Croissance
MDG	Millennium Development Goals
MSF	Médecins Sans Frontières
MSE	Mean Squared Error
MUFFA	Mutuelle Financière des Femmes Africaines
MFI	Microfinance institutions
NGO	Non-governmental organization
ODA	Official Development Aid
OLS	Ordinary least squares
ONCPB	Office National de Commercialisation des Produits de Base
PSM	Propensity Score Matching
PRSP	Poverty Reduction Strategy Papers
PADMIR	Projet d'Appui au Développement de la Microfinance Rurale
RoSCAs	Rotating savings and credit associations
SSA	Sub-Saharan Africa
SAP	Structural Adjustment Programs
UNDP	United Nations Development Program
SDI	Subsidy Dependence Index
USD	United States Dollar
UBC	Union Bank of Cameroon
WEAI	Women's Empowerment in Agriculture Index

1. Introduction

One cause of poverty in developing countries may be the lack of productive capital for income creating activities. This link has been long acknowledged. For instance, (Nurkse, 1953, p. 4) presented already the so-called vicious circle of poverty, also addressed as poverty trap. He argued that when producing at subsistence level, it is difficult to accumulate savings for undertaking investments. If there are no investments, there is no increase in productivity and so no improvement in income. Obviously, there are various theories to explain the persistence of poverty. Nevertheless, there is hardly any doubt that investments are crucial for growth at any level of the economy, given that the supporting private and public institutions are favorable to growth. The question is how to finance the investments: through own capital/savings, domestic debt or transfers, foreign debt or transfers in the form of official development aid (ODA)? In the absence of sufficient domestic funds to give investments a big push, more recently (Sachs, 2005) explained that the poor will remain in a trap. Because they cannot escape the poverty trap on their own, he proposes to break the trap through "targeted investments backed by donor aid." In the end, this should result in self-sustaining economic growth. While Sachs proposed substantial ODA to push investments, Nurkse was more open to various capital sources. At the level of the poor individual or household, microfinance[1] has become popular. Obviously, microfinance services may be subsidized by private or public agencies too, for them to become eventually financially sustainable.

As mentioned above, microfinance[2] refers to various services, not only microcredit but also savings and insurance services. Nevertheless, this work is mainly concerned with the effect of microcredit as a popular instrument of private and public agencies involved in development and aiming at reducing poverty among poor people, particularly poor

[1] The Microfinance Gateway of the Consultative Group to Assist the Poor (CGAP) defines microfinance this way: Microfinance is the provision of financial services to low-income people. In this context, low-income households ought to have permanent access to high-quality and affordable financial services to finance income-producing activities, build assets, stabilize consumption, and protect against risks. Initially the term was closely associated with microcredit, namely small loans to borrowers with little or no collateral. Meanwhile the term has evolved to include a range of financial products, such as savings, insurance, payments, and remittances (CGAP: http://www.microfinancegateway.org/what-is-microfinance, accessed August 2014).

[2] In this study microfinance refers to as financial intermediary or microfinance intermediary.

women, with the skills to become self-employed and raise income (Khandker, 1998). Microcredit for women is promoted not only as a strategy for poverty reduction (women are said to be more likely to share the income with others in their household, especially their children) but also for women's empowerment (Mayoux, 1998, p. 39). Within the last two decades, the microfinance movement has reached millions of low-income people of both sexes and in 2006, Prof. Mohammad Yunus was awarded the Nobel Peace Prize for his efforts to create economic and social development from below through microcredit provided by the Grameen Bank in Bangladesh, which he had founded.

However according to (Hulme, 2009, p. 198) the achievement of such a movement remains controversial. Some studies argue that microfinance, i.e. microcredit has very beneficial economic and social impacts (among others: (Holcombe, 1995), (Hossain, 1988) and (Schuler, Hashemi, & Riley, 1997). Others are against such optimism and argue that microfinance can have negative impacts (for instance: (Adams & von Pischke, 1992), (Buckley, 1997) and (Montgomery, 1996), and others are indifferent. They identified positive impacts but argue that microfinance doesn't improve the lives of the poor as much as is often claimed (Hulme & Mosley, 1996), (Mosley & Hulme, 1998) and (Buchenrieder & Heidhues, 2005).

Obviously, there exists no unanimous view with regard to the impact of microfinance (for a review see e.g. (Schrieder & Sharma, 1999) as well as (Buchenrieder & Heidhues, 2005). Impact analyses of microcredit on poverty alleviation and women's empowerment are not always showing a positive impact. The shortcoming with regard to microcredit impact analysis in Cameroon may be attributed to the data availability with regard to size and period. For instance, (Schrieder, 1996) and (Djoum, 2006) used a cross sectional data analysis and (Djeudja, 2006), a two period panel dataset. To the best of knowledge, the panel data analysis presented in this work, covering three points in time, is the first research work in Cameroon using a longitudinal datasets for microcredit impact evaluation.

1.1. Problem statement

The lower-middle income country Cameroon aims at becoming a so-called emerging economy by the year 2035 and, in this process, one of the targets of the

Cameroonian government is to reduce poverty[3] and to strengthen the social role and economic position of women. One of the vehicles considered by academia and politicians successful to alleviate poverty in general and empower women in particular, is microfinance, particularly microcredit. The Cameroonian government propagated that investing in microfinance is a strategy to overcome poverty in rural Cameroon. Cameroon after having achieved the so-called completion point in 2006 of the Heavily Indebted Poor Country (HIPC) initiative is using the HIPC funds to finance social development, education, health, infrastructure, rural development (agricultural project, microfinance, etc.) and governance improvement strategies. The government offers microcredit at rather low interest rates to the rural poor through microfinance institutions as one poverty alleviation instrument (see section 3.4 for more details). This research will contribute to clarify the question, whether microcredit is truly reducing rural poverty in Cameroon by means of a longitudinal data analysis.

1.2. Objectives

This work aims at identifying empirically the impact of access to microcredit on poverty in general and empowerment of women in particular. The empirical work was implemented in the West Province of Cameroon. Panel data was collected among borrowers of village banks called '*Mutuelles Communautaires de Croissance*' (MC^2, or in English the Community Growth Mutual Funds) and matching non-borrowers. The microfinance intermediary MC^2 was founded in 1992 and is defined as the village bank created, owned, controlled, and managed by the people of the community with the support of the *Caisse Commune d'Epargne et d'Investissement* (CCEI Bank), now known as Afriland First Bank and the non-governmental organization (NGO) called Appropriate Development for Africa Foundation (ADAF)[4].

The specific objectives of this study are:

[3] Almost 40 percent of Cameroon's population lives below the national poverty line. 70 percent of the population depends on agriculture and pastoral activities for their livelihood (UNDP, 2012).

[4] See the homepage of ADAF for more information at http://adaf-amc2.org/.

- to investigate the impact of microcredit on household income using panel data;
- to explore various determinants of women's empowerment with and without access to microcredit;
- to analyze the role of microcredit involved in women's decision making at the household level; and
- to discuss the challenges that married women face after having received the microcredit and how they manage them.

1.3.Hypotheses and research question

The overall research questions are: How robust is the evidence that microcredit access reduces household poverty? Microcredit ought to empower (married) women, what is the evidence at the household level? The hypotheses are as follows:

- Microcredit has a significant positive impact on household income.
- Microcredit contributes to increasing women's empowerment, specifically their decision making ability with regard to their activities and income.
- Married women face new family challenges when their economic status has improved due to microcredit access.

1.4.Structure of the work

The rest of study is organized as follows: Chapter 2 presents a literature overview of microfinance. It develops challenges microfinance faces and discusses how an improvement of household income may positively impact children's education, food consumption and health care. The chapter outlines the household agricultural model, since the microfinance MC^2 opted for our case study is located in the rural area and the main activity in the rural area is agriculture. Chapter 3 reviews Cameroon's financial markets focusing on microfinance. In section 3.1, the causes of slow growth in sub-Saharan Africa are presented and an overview of economic crises in sub Saharan Africa is given in this section, with the focus on Cameroon. In section 3.2 the chapter discusses the financial sector in Cameroon and in section 3.3, it presents the microfinance in

Cameroon, its origin, with the focus on the microfinance case analyzed here, namely MC^2. The chapter outlines in the last section the role that Cameroonian's government plays in supporting microfinance. The methodological challenges and the sample are described in chapter 4. The chapter presents in section 4.1 the fundamental issue to evaluate the impact of a program on outcome variables in particular, the evaluation of the impact of microcredit on household income. In section 4.2, it discusses the methodological framework to address this issue and focuses on the two methods chosen –namely the Propensity score matching (PSM) and the difference-in-difference matching models (DID). The section 4.3 gives an overview of the study area, describes the panel data and presents the variables used in the empirical model. The weakness of the sample and measures undertaken to maintain the highest degree of data accuracy are discussed in this section. Chapter 5 and 6 present respectively the results of the impact of microcredit on household income and women's empowerment. Chapter 6 discusses the concept of the empowerment of women in Section 6.1 and then investigates in section 6.2 the impact of having access to microcredit on women's empowerment for a case study from West Cameroon. It also discusses the family challenges that particularly married women face after receiving microcredit and how they manage them. Chapter 7 summarizes the finding, concludes the thesis and gives some recommendations.

2. Literature review: Effects of microfinance on poverty alleviation

The Consultative Group to Assist the Poor (CGAP) has defined microfinance as the provision of financial services to low-income people. Financial services generally include credit, savings, insurance, and payment services. Often, financial intermediaries providing microfinance services, complement this with offering social intermediation services such as group formation, training in financial literacy and management capabilities (Ledgerwood, 1999, p. 1).

How can microfinance effectively reduce poverty? To answer this question, the term poverty needs to be defined. Poverty has three dimensions: extreme (absolute) poverty, moderate poverty and relative poverty[5]. Extreme poverty means an individual cannot meet basic needs for survival (according to the World Bank, this is a person living at or below 1.25 USD per day). Generally, extreme poverty only occurs in developing and transition countries. Moderate poverty indicates basic needs are met but just barely, and relative poverty means an income level that is below a given proportion of average national income. Someone who lives in high income countries, who lacks access to recreation, entertainment, quality of education, health care etc. is considered as relatively poor (Sachs, 2005, p. 20). Cameroon's most recent household survey (ECAM III), undertaken in 2007 revealed that extreme poverty affects almost 40 percent of Cameroon's population and they reside mostly in the rural area. However, governments, donors, and NGOs continue looking for a way to provide financial services to the rural poor, anticipating that the poor profit from access to financial services, particularly microcredit and can thereby improve their livelihoods, eventually escaping poverty.

This chapter is structured as follows: the challenges facing microfinance are developed in section 2.1 and the link between microfinance and poverty alleviation is presented in section 2.2. The microfinance intermediary known as MC^2 opted for our case study is located in the rural area and the main activity in the rural area is agriculture.

[5] For a comprehensive discussion and definition of poverty, refer for instance to (Sachs, 2005, p. 20) in the book entitled "The end of the poverty: Economic possibilities of our time".

Therefore, we introduced a household agricultural model, in section 2.3 to theoretically link the income generation of farm households to the credit market.

2.1. Microfinance: tradeoff and synergy among outreach, sustainability and impact[6]

With the explosive expansion of microfinance in the 1990s, poor people, who had been previously rejected by the formal financial sector (mainly because of the lack of collateral), have become access to formalized financial services for the first time. A conceptual framework: the so called triangle of microfinance has been developed by (Zeller & Meyer, 2002) to analyze the challenge of microfinance. The framework has three parts: (1) reaching the poor in substantial numbers, (2) creating financial intermediaries that are sustainable and (3) allowing the poor to move out of poverty. The lack of access to formal financial services may condemn the poor to remain in the poverty trap. This subsection investigates the correlation among the above objectives.

The full promise of microfinance is to reduce poverty on the costumer side and achieve financial self-sufficiency on the service supplier side. That is moving the poorest of the poor out of poverty by providing financial services in a financially sustainable way. But why does this promise remain till today unmet despite all the operational innovations with regard to microfinance provision? Some analysts argue that there is a tradeoff between serving the poor (especially the poorest) and achieving financial sustainability. The tradeoff is due to the high transaction costs that arise from serving this type of clientele (Hulme & Mosley, 1996), (Cull, Demirgüç-Kunt, & Morduch, 2007), (Hermes & Lensink, 2007), (Kipesha & Zhang, 2013), and (Abate, Borzaga, & Getnet, 2014). Therefore microfinance as understood by CGAP may require subsidies (at least in its initial phase) to cover its costs if it wants to reach the poor, or even the poorest, that is also follow a social mission. Without subsidies microfinance has to charge a fully cost covering interest rate from the beginning, that is at a time when neither economies of scope or scale are at work, and therefore, a “mission drift” may occur. That is diverting from its social objective. However, microfinance intermediaries benefiting from subsidies may become dependent on them. The question is whether these subsidies generate sufficient social value in the sense of alleviating poverty. And do they generate

[6] This section has benefited substantially from Zeller & Meyer (2002): The triangle of microfinance: Financial sustainability, outreach and impact.

more social value than alternative social investments? Here the question is what is the opportunity cost of subsidizing microfinance intermediaries? This is because the respective donor, regardless of national or international could have used the subsidy for alternative purposes such infrastructure, education, or health care, measures that are also said to contribute to poverty alleviation. Therefore, it is useful to evaluate the costs and benefits of microfinance subsidies (Zeller & Meyer, 2002, p. 5).

The Subsidy Dependence Index (SDI) was subsequently developed by (Yaron, 1992) as indicators of sustainability. It indicates how much higher the interest rates charged to borrowers would have to be for the microfinance institutions (MFIs) to cover their full costs. (Morduch, 1999c) found that the SDI for the Grammen Bank was about 75 percent between 1985 and 1996. However, the SDI has a drawback that it focuses only on financial sustainability of microfinance and does not indicate to what importance subsidies are justified. It does not compare the costs and benefits of subsidies (Hermes & Lensink, 2007, p. F7). Clearly, much has been done to reduce operating costs and making lending less costly, for example, group lending, credit cards or cellular phone to complete the banking transaction. All these measures may contribute to acquiring economies of scale and scope. But still much remains to be done to reduce the operating costs of microfinance. Addressing the issue of costs and benefits of microfinance subsidies leads us to the next issue: the impact on poverty and depth of outreach.

As we mentioned above, (Hulme & Mosley, 1996) and others (e.g. (Zeller & Meyer, 2002), (Ghalib, 2011) argue that microfinance doesn't improve the lives of the poor as much as is often claimed. It may improve the welfare of the very poor, but will not lift them out of the poverty because poor people lack access to input and output markets, education, technology, and other factors that contribute to raising their income. This is the reason why national and international donors, more and more are recognizing that their proper role is not to provide directly microfinance services, but to create conditions that can promote an expansion of the frontier of financial services (CGAP, 2004, p. 23). This means creating an institutional environment that is conducive to financial deepening. The financial deepening means the expansion in financial transactions of all kinds, the provision of more services (not just loans but also savings, insurance and payment services) in rural areas in order to reach broader clienteles including the poorest of the poor (Gonzalez Vega, 2003, p. 6).

Studies acknowledge the presence of tradeoffs but also synergies among outreach, financial sustainability and impact. Although policymakers are giving priority to the economic stability and a favorable institutional environment as the key point to promote deeper rural financial markets, (Morduch, 2005, p. 2) suggested that MFIs need subsidies for the start-up. But the subsidy should be limited to the first 5-10 years of operation: the so called "smart subsidy". The limited subsidy pushes MFIs to be innovative, cut costs, and improve products and services and therefore "attracts new investors to the sector, reinforcing calls for professionalism, transparency, and good governance". None of this is likely to happen with subsidy (Morduch, 2005, p. 2). The medium-term objective of financial sustainability forces microfinance to improve financial products and to increase the number of clients, i.e. the outreach. If the economic stability is maintained and the institutional environment is conducive, this will attract the investors, therefore leads to the concurrence in rural financial sectors (even with limited subsidies) and MFIs will be forced to improve theirs financial products, and as an eventual result, the poorest of the poor might be served too.

2.2. Is there a role for microfinance in fighting poverty?

Poor people often lack basic public goods such as clean water, health care, and education. The promise of microfinance is to provide appropriate financial services to them, which will also improve their access to the above mentioned public goods by increasing their income through the credit financed investments. Microfinance promises to break the vicious circle of poverty by providing them small loan (microcredit) for investments that will improve their productivities and therefore their incomes and welfare. Nonetheless, poor households face credit constraints in the sense that they may not be capable to borrow the amount they wish or they may have to pay higher interest rates than would be reflected by their creditworthiness. This is a barrier to the growth of their enterprises. In the following sub-section, we come back to explaining how microfinance can influence particular outcomes that often accompany poverty alleviation: household income, school enrollment of children, nutrition, health care, household assets, women's empowerment etc. Let just focus on certain ones.

2.2.1. Impact of microfinance on household income

Microcredit to the poor is not normally able to produce dramatic changes in their income (Mosley & Hulme, 1998, p. 787). Poor households face multiple constraints on earning opportunities such as lack of education, incomplete access to input and output markets, etc. Access to credit can give poor households with little or no savings the ability to acquire agricultural inputs or expand family enterprises. For ultra-poor to benefit from microfinance services and to improve their productivity and therefore their income, complementary social intermediation services should be provided such as basic literacy programs, training in enterprise management, education in health and nutrition (Schrieder & Sharma, 1999, p. 70). Some studies argue that the impact of microfinance on household income tends to increase, at a decreasing rate (Mosley & Hulme, 1998) . Others claimed that on average, microfinance tends to stabilize income rather that increase and tend to preserve rather create jobs (Berger, 1989) cited by (Schrieder & Sharma, 1999, p. 69). The long-term effect of microfinance on income studied by (Tschach, 2003) reveals a significant positive effect on the wage levels of employees in the informal sector. (Hulme & Mosley, 1996) studied the impact of thirteen MFIs in Africa, Asia and South America on the poor and concluded that the middle and upper income poor benefit more than the lower income quintile: cited by (Buchenrieder & Heidhues, 2005, p. 294). The *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) recently evaluated the impact of microfinance in Sri Lanka and also found a positive impact on income (Czura, 2010). In general, however, up to today, there is no rigorous method to measure the impact of microfinance on household outcome, particularly a method that can be applied universally. Empirical results are mixed. The problem may lie on methodological framework used.

2.2.2. Impact of microfinance on human capital

Human capital may refer to nutrition, health and education.

Food and nutrition security: Agriculture is a fundamental instrument for sustainable development, poverty and hunger alleviation. It is a source of growth for a national economy in developing countries and the source of livelihoods for rural people; and three of every four poor people in developing countries live in rural areas (World Bank, 2008, p. 1). Therefore policy makers invest in agriculture and rural development to boost food

production and thus improve nutrition. Very poor households with low income are chronically hungry (undernourished) and malnourished. Malnutrition contributes to child illness; decreases learning ability and higher mortality. The lowest income quartile households spend as much as 91 percent of their consumption budget on food (Zeller & Sharma, 1998, p. 8). In West Africa for example, the current Ebola disease will have severe implications for food and cash crop production in the affected areas and therefore could lead to rising numbers of chronically hungry (FAO, 2014, p. 1). In Cameroon too the study on mortality and malnutrition carried out by Médecins Sans Frontières (MSF) in April and May 2014 confirmed the disturbing nutritional situation of Central African Republic refugees in eastern Cameroon (FAO, 2014, p. 5). These are only two examples of many showing that food insecurity is a serious issue in developing countries and the intervention of donors and states is very crucial. The promise of microfinance is not to play the state's role, but to provide microcredit to the poor that would increase their income and, then improve food security. (Pitt & Khandker, 1998) and Khandker (2005) argue that access to microcredit might have a positive impact on food expenditures especially with women. (Schrieder, 1996), (Imai & Azam, 2012) also find a positive effect of microcredit on food consumption.

Health care: Improving health conditions of the poor in developing countries is another focal issue in development. Almost 11 million children die every year mainly from diarrhea and malaria. More than 500,000 women die during pregnancy and childbirth every year. Almost 3 million of people died from HIV/AIDS in 2006 (World Bank, 2007, p. xi). Poor people have to sell their assets or borrow to cover the costs of medical care. However, a good health condition boots economic growth, and economic growth leads to gains in health (Jamison, 2006, p. 8). Jamison states that investing in health may increase life expectancy, and long and better healthy lives improve the productive potential of individuals, which result to higher levels of national income in the long run (See Table 2.1 below for the impact of microfinance on health care)

Child education: Agriculture, health and education are considered fundamental for development and growth, especially in countries where still a majority of the population is employed in agriculture and lives in rural areas. Access to education reinforces people's capacity "to make informed decision, be better parents, sustain a livelihood, adopt new technologies, cope with shocks, and be responsible citizens and effective stewards of the natural environment" (World Bank, 2011, p. 11). The United Nations

Convention on the Rights of the Child (1989) article 28 recognizes a child's right to education and; denying the child this right is depriving him/her the chance to have a pleasing life. In fact, investing in basic nutrition during pregnancy and infancy is found to have a positive and significant impact on early childhood development, which in turn significantly contributes to educational attainment, employability, and future income (Jamison, 2006, p. 9). So low income abets to malnutrition, which in turn leads to illness (death or reduces life expectancy), then decreases learning capacity, mitigates the production capacity and results to lower income. The promise of microfinance is to meet the needs of vulnerable poor in the sense that small loans will improve income and therefore the poor should be able to send their children to school, improve their nutritional status and health status. Some MFIs provide microcredit for children enrollment: the so called „school loan". Some potential microfinance clients might be motivated to engage in MFIs because of the innovative credit product. Most of them do not offer explicit microcredit for health care but if a participant is unable to reimburse her/his loan because of illness, most MFIs prolong the credit term and/or even provide a microcredit for health care so that the client gets cured and can refund the loan. (Pitt & Khandker, 1998) found a positive impact of microcredit on child education which is contested by (Morduch, 1999). (Coleman, 1999) found a positive effect on health care and education (see Table 2.1 for more example).

2.2.3. Impact of microfinance on women's empowerment

The term empowerment has no clear definition. It refers broadly to the expressions like "self-strength, control, self-power, self-reliance, own choice, life of dignity in accordance with one's values, capacity to fight for one's right, independence, own decision making, being free, capability, self-confidence and self-worth" (Noreen, 2011, p. 318); (Narayan, 2005, p. 3); (Narayan, 2002, p. 13).

In many parts of the world, women continue to lack voice and decision making ability, and their economic opportunities remain very limited. The social and economic status of women, especially in rural areas, remains low. Strengthening the social role and making women more economically autonomous is one of the targets of politicians.

One of the vehicles considered by academia and politicians successful in empowering women is access to microcredit. However microcredit is not necessarily a panacea for

women's empowerment. Some studies argue that, on the one hand, microcredit access can empower women by improving their economic status and their welfare. On the other hand, may provoke violent behavior in their husbands because they see their authority over their wives being undermined (Schuler, Hashemi, & Badal, 1998, p. 148); (Wrigley Asante, 2012, p. 357). To optimize the beneficial impact of microcredit on poor married women, creating an environment within the household without tension and violence is very important. The Table 2.1 outlines the new evidence of microfinance in sub-Saharan Africa.

Table 2.1: Impact of microfinance in sub-Saharan Africa

Study	Country	Income	Saving	Assets	Health	Food security	Education	Women's empowerment
(Adjei, Arun, & Hossain, 2009)	Rural & urban Ghana		+	+(not over time)	+		+	
(Ashraf, Gine, & Karlan, 2008)	Rural Kenya	+						
(Barnes, Gaile, & Kibombo, 2001)	Rural & urban Uganda		+	+			−	
(Brannen, 2010)	Rural Tanzania			+ (not over time)	+	+	No effect	
(Barnes, Keogh, & Nemarundwe, 2001)	Urban Zimbabwe	+		+	+	+	+(boys) − (girls, especially for continuing clients	+
(Doocy, Teffera, Norell, & Burnham, 2005)	Rural Ethiopia					Not effect		
(Dupas & Robinson, 2008)	Rural Kenya	No effect	+		+	+		
(Gubert & Roubaud, 2005)	Urban Madagascar	+					Not effect	
(Lacalle, Rico, & Duran, 2008)	Urban Rwanda			+	+		+	
(Lakwo, 2006)	Rural Uganda							+
(Pronyk, Kim, Abramsky, Phetl, & Hargreaves, 2008)	Rural South Africa				+			Mixed
(Nanor, 2008)	Rural Ghana	Mixed					Mixed (+ for some districts, − for others)	
(Shimamura & Lastarria-Cornhiel, 2009)	Rural Malawi					+	− (for primary & not effect for secondary)	
(Ssewamala, Ismayilova, McKay, Sperber, & Bannon, 2010)	Rural Uganda		+		+		+	
(Wakoko, 2004)	Rural and urban Uganda							Not effect

Source: Adapted from (Van Rooyen, Stewart, & De Wet, 2012, pp. 2252-9)

Table 2.1 reveals that the impact of microfinance is mixed. Regarding its impact on income, some studies found a positive effect (Ashraf & al. (2008) and Barnes, Keogh & al. (2001) and Gubert & al. (2005), but Nanor (2008) evaluated the impact of microfinance on household income in rural Ghana and found a mixed result and argued that the longer a client stayed in a microfinance scheme, the worse her/his business profit became. Suppressing that, microfinance can have a negative impact on children's education. In Africa, particularly in Sub-Saharan African, most of poor live in rural areas with little income and therefore have difficulties to pay school expenses for their children. Thus they tend to give the priority to the boys. (Shimamura & Lastarria-Cornhiel, 2009) found that microfinance decreases the girls primary school attendance among borrowers' children in rural Malawi. (Van Rooyen, Stewart, & De Wet, 2012) mentioned that children are not being taken out of school to work for their parents. Because of the lack of money, parents are more likely to pay school expenses for boys than the girls. But in some African countries like in Cameroon, the government has given the chance to every child to attend the primary school. It has reduced the fees for primary school and the results indicate that between 2001and 2007, the enrolment in primary education in Cameroon was 83 percent and the ratio of girls to boys across primary, secondary and tertiary education is 0.7 (IMF, 2010, p. 36). However, for the case study in Cameroon, Djeudja (2006) and Djoum (2006) have found a positive impact of microfinance on household income and Schrieder (1996) a positive impact on food security.

2.3. Theoretical analysis: household agricultural models

Agriculture is the main source of income and employment for 70 percent of the world's poor living in rural areas. Particularly in sub-Saharan Africa, 64 percent of the rural population depends on agriculture (World Bank[7], 2011). Cameroon's population is estimated at 22 million inhabitants in 2013 with almost 40 percent of the population living below the national poverty line. These poor live mostly in rural areas and are largely dependent on agriculture. Therefore a sustainable financial intermediary catering to agriculture is thought to be an important development strategy. Whether or not theory supports this hypothesis, is discussed in this section.

[7] http://donnees.banquemondiale.org/theme/agriculture-et-developpement-rural (accessed June 12, 2013).

Subsequently, this section analyzes the theoretical effect of microcredit on income of agricultural households through an economic model. We are focusing the theoretical discussion on agricultural households for two reasons. First, for the reasons very briefly outlined above. Second, the financial intermediary analyzed empirically in this dissertation is also catering mainly to rural agricultural households. In fact, almost 100 percent of the sample constitute rural households with agriculture being either their first or second income creating activity.

Agricultural households are at the same time producers and consumers and therefore a neoclassical producer-consumer model is used. We will first present the separable household model with perfect markets (that is observing the behavior of agricultural households as consumers and then producers separately) and the non-separable household model with the demand for microcredit. Both models are presented and discussed to provide a good overview of the theoretical background. However, the credit market is constrained; therefore, this work used the non-separable household model.

2.3.1. Separable household model with perfect markets[8]

When markets are perfect, market prices support a separation of household consumption and production decisions (Benjamin, 1992, p. 287). Perfect markets mean "*all products and factors are tradable and the opportunity cost of any product or factor held by the household is its market price"* (Sadoulet & Janvry, 1995, p. 149). In economic theory, an agricultural household, respectively the farm owner is considered as a producer, consumer and worker. The producer maximizes profits subject to constraints determined by market prices, fixed factors and technology. The consumer maximizes utility subject to constraints determined by the market prices, disposable income and the laborer maximizes utility with respect to income and so called home time[9], subject to the

[8] This section has benefited substantially from Sadoulet & Janvry (1995, pp. 141-149) and input of Dr. Maarten Punt at the Technical University of Munich (TUM).

[9] Home time is the time for family maintenance, family reproduction, socialization and leisure (Sadoulet & Janvry, 1995, p. 143). The so-called family reproduction refers to the role of women with regard to childbearing/rearing responsibilities, and domestic tasks. The fulfillment of the role tasks are required to guarantee the maintenance, e.g. by producing the food needed to feed the family and reproduction of the labor force. It includes not only biological reproduction but also the care and maintenance of the work force (male partner and working children) and the future work force (infants and school-going

constraints determined by the market wage, total time available. The household model is separable and the problems of production decision, and consumption and labor supply decisions can thus be solved in two steps:[10]

a. **The production problem is solved** (Sadoulet & Janvry, 1995, pp. 141-9)

The household produces an output q_t priced p_a, using two variable factors: x_t (productive capital such as seed, fertilizer, etc.) with price $p_{x,t}$ and labor l_t with price w. The subscript t is 1 for period 1 or 2 for period 2. There are i fixed factors, we denote their level as vector z^i. The household takes credit in period 1 (K_1) and pays it with the interest rate r. Profit is denoted with π and maximum profit with π^*. The producer's profit maximization problem then becomes:

$$Max_{(x_t,l_t,q_t,K_1)} \sum_{t=1}^{t=2} \pi = \left(p_a q_t - p_{x,t}x_t - wl_t + K_1 - (1+r)K_1\right) \quad (2.1)$$

$$subject\ to: \left(q_t, x_t, l_t, K_1, r, z^i\right) = 0 \quad (2.2)$$

where (2.1) is the profit and (2.2) the production function. Solving this model gives us the reduced form:

$$\text{Supply function:} \quad q_t = q_t(p_a, p_{x,t}, w, r, z^i) \quad (2.3)$$

$$\text{Factor demands: } x_t = x_t(p_a, p_{x,t}, w, r, z^i) \quad (2.4)$$

$$K_1 = K_1(p_a, p_{x,t}, w, r, z^i) \quad (2.5)$$

$$\text{and} \quad l_t = l_t(p_a, p_{x,t}, w, r, z^i) \quad (2.6)$$

$$\text{Maximum profit: } \pi_t^* = \pi_t^*(p_a, p_{x,t}, w, r, z^i) \quad (2.7)$$

b. **The consumption/work problem is solved using maximum profit π^* achieved in production** (Sadoulet & Janvry, 1995, pp. 141-9)

children) (ILO, 1998), A conceptual framework for gender analysis and planning, http://www.ilo.org/public/english/region/asro/mdtmanila/training/unit1/groles.htm, accessed June 26, 2014).

[10] Please refer to the Section-annex for a list of all model symbols used.

The consumer consumes $c_{a,t}$ of the output q_t with the price p_a (prices are fixed), consumption depends on disposable income Y. The total time endowment available is E; time worked is $l_{s,t}$; the home time is $l_{h,t}$ and the household fixed characteristics are z^h. As home time is an indirect form of consumption, we define $c_{l,t} \equiv l_{h,t}$. Furthermore disposable income is a function of wage only, that is:

$$Y_t = w l_{s,t} \tag{2.8}$$

The household's utility maximization problem then becomes:

$$\max_{(c_{a,t}, c_{l,t})} \sum_{t=1}^{t=2} u(c_{a,t}, c_{l,t}, z^h) \tag{2.9}$$

Subject to:

$$Y_t + \pi_t^* - p_a c_{a,t} = 0, \tag{2.10}$$

$$E = l_{s,t} + l_{h,t}, \tag{2.11}$$

Where 2.9 is the utility function and 2.10 and 2.11 are respectively the income and time constraint. Y^*denotes maximum income. Solving the model gives us the reduced form:

Demand functions: $$c_{a,t} = c_{a,t}(p_a, w, Y_t^*, z^h), \tag{2.12}$$

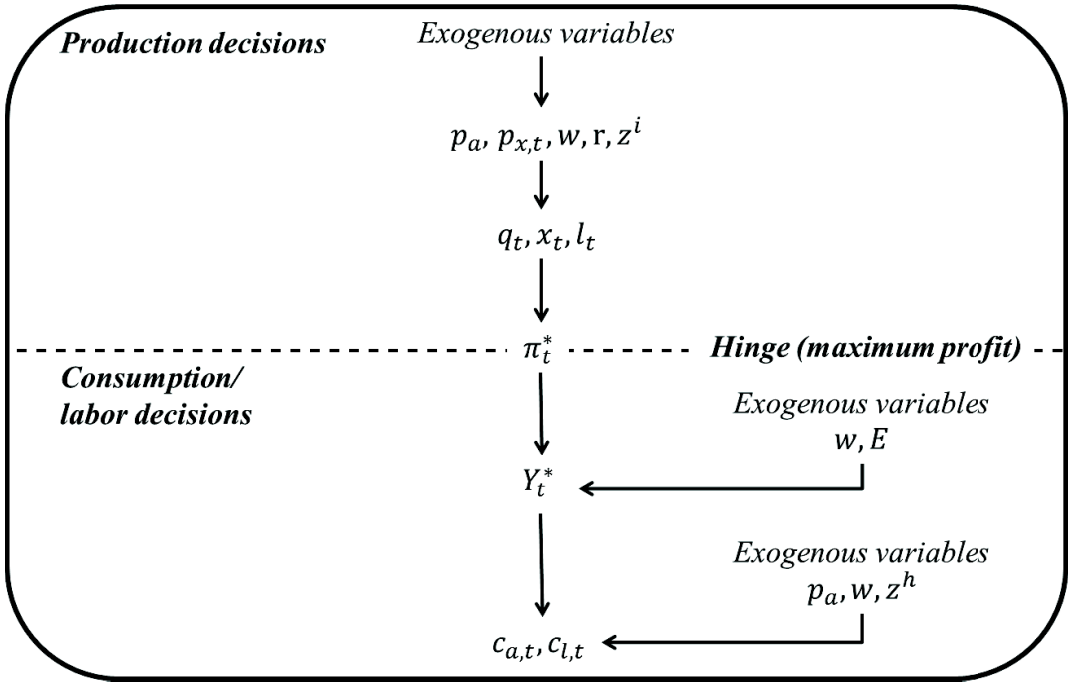
$$c_{l,t} = c_{l,t}(p_a, w, Y_t^*, z^h) \tag{2.13}$$

Where

$$Y_t^* = \left(q_t p_a - p_{x,t} x_t\right) + (wE - w l_t) \tag{2.14}$$

All these interdependencies can be illustrated in Figure 2.1 below.

Figure 2.1: Casual ordering in the separable household model



Source: adapted from (Sadoulet & Janvry, 1995, p. 146)

From the above presented relationships, we can derive the following indicators:

Marketed surplus $= q_t - c_{a,t} > 0$, net seller

< 0, net buyer

Labor supply $= l_{s,t} = E - l_{h,t}$

Labor balance $= l_t - l_{s,t} > 0$, hire in,

< 0, hire out.

2.3.2. Non separable household model with market failure and credit constraint

In praxis, the farmer is located in an environment where the market is not perfect. (Sadoulet & Janvry, 1995, p. 150) pointed out that with market failure, products (agricultural commodities) and factors (inputs) used are no longer tradable. *"Their prices are not determined by the market but internally to the household as a shadow price. When a household needs to decide what to produce and how to earn income in different activities in a situation where some markets fail, then there is no longer separability between production and consumption decisions. The household's production/income problem must be determined simultaneously with its consumption decisions*".

Furthermore, non-separability may be important for instance when sales and purchase prices differ for the same good, or when markets are incomplete (Singh, Squire, & Strauss, 1986, p. 48). Credit is a particularly important element in agricultural production. It allows greater consumption and greater purchased input use (Feder, Lau, Lin, & Luo, 1990, p. 1151). But when credit is rationed, some borrowers cannot obtain the amount of credit they desire or they may even be totally denied credit. A frequent consequence of market failure is such credit constraints (Sadoulet & Janvry, 1995, p. 150). Generally we can state, however, the farmer will maximize utility function subject to the budget and the credit constraint. This section has benefited substantially from the methodology of (Iqbal, 1986), (Sadoulet & Janvry, 1995) and (Petrick, 2004).

The following section describes a non-separable household model with market failure and credit constraint. Let us assume that the farmer will take loan K in order to purchase inputs for the production in period 1 and repay it after harvest in period 2. Let us call $c_{a,1}$ and $c_{l,1}$ respectively the consumption and home time in period 1 and $c_{a,2}$ and $c_{l,2}$ consumption and home time in period 2 (harvest). The farmer's income is augmented by transfers T_1 and T_2 in period 1 and 2, respectively, and by the remaining capital F from previous periods. The inputs financed with K_1 in period 1 are of an improved type that causes an exogenous growth in the harvest of α (the technical change in agriculture). Therefore the capital inputs in period 1 x_1 have a different price $p_{x,1}$ from the capital inputs in period 2 x_2 (priced $p_{x,2}$).

The farmer's problem can be written then as follows (adapted from (Petrick, 2004, pp. 77-83)):

$$Max\ u\left(c_{a,1}, c_{a,2}, c_{l,1}, c_{l,2}, z^h\right) \tag{2.15}$$

with respect to $c_{a,1}, c_{a,2}, c_{l,1}, c_{l,2}, x_1, x_2, K_1 > 0$ (2.16)

subject to

$$F + wl_{s,1} + T_1 + K_1 + p_a f(x_1, z^i) - p_a c_{a,1} - p_{x,1} x_1 = 0 \tag{2.17}$$

$$E - c_{l,1} - l_{s1} = 0 \tag{2.18}$$

$$K^{max} - K_1 \geq 0 \tag{2.19}$$

$$\alpha p_a f\left(x_1, x_2, z^i\right) + wl_{s,2} + T_2 - p_a c_{a,2} - p_{x,2} x_2 - (1+r)K_1 = 0 \tag{2.20}$$

$$E - c_{l,2} - l_{s,2} = 0 \tag{2.21}$$

$p_a c_{a,1,2}$ represents the expenses on consumption in period 1 & 2 with p_a the price of the consumption bundle. $p_{x,1}\, x_1$ are the expenses on the input variables that require the funding (e.g. seed, fertilizer, etc.). $p_{x,2} x_2$ constitutes the expenses for the remainder of the input variables that do not require the funding (after using the credit to purchase seed, fertilizer and others, the farmer may still need some additional inputs in period 2). $g_1 = f(x_1, z^i)$ and $g_2 = f(x_1, x_2, z^i)$ are respectively the production function for the period 1 and 2. The term $(1 + r)K_1$ represents the repayment of credit from period 1 with r, the interest rate and K^{max} the maximum credit the farmer could potentially receive if the market were perfect. Since the credit market is imperfect, the credit obtained (K_1) might be smaller than K^{max}.

To solve this optimization problem, we form the Lagrangian and use the Kuhn-Tucker conditions:

$$L = u(c_{a,1}, c_{a,2}, c_{l,1}, c_{l,2}, z^h) + \mu(F + w(E - c_{l,1}) + T_1 + K_1 + p_a f(x_1, z^i) - p_a c_{a,1} - p_{x,1}\, x_1) + \lambda[\alpha\, p_a f(x_1, x_2, z^i) + w(E - c_{l,2}) + T_2 - p_a c_{a,2} - p_{x,2} x_2 - (1 + r)K_1] + \eta(K^{max} - K_1) \tag{2.22}$$

$$\frac{\partial L}{\partial c_{a,1}} = \frac{\partial u(.)}{\partial c_{a,1}} - \mu p_a = 0 \tag{2.23}$$

$$\frac{\partial L}{\partial c_{a,2}} = \frac{\partial u(.)}{\partial c_{a,2}} - \lambda p_a = 0 \tag{2.24}$$

$$\frac{\partial L}{\partial c_{l,1}} = \frac{\partial u(.)}{\partial c_{l,1}} - \mu w = 0 \tag{2.25}$$

$$\frac{\partial L}{\partial c_{l,2}} = \frac{\partial u(.)}{\partial c_{l,2}} - \lambda w = 0 \tag{2.26}$$

$$\frac{\partial L}{\partial x_1} = -\mu p_{x,1} + p_a \mu \frac{\partial f(.)}{\partial x_1} + \alpha \lambda p_a \frac{\partial f(.)}{\partial x_1} = 0 \tag{2.27}$$

$$\frac{\partial L}{\partial x_2} = \lambda \left(\alpha\, \lambda p_a \frac{\partial f(.)}{\partial x_2} - p_{x,2}\right) = 0 \tag{2.28}$$

$$\frac{\partial L}{\partial K_1} = \mu - \lambda(1 + r) - \eta = 0 \tag{2.29}$$

$$\frac{\partial L}{\partial \mu} = \left(F + w(E - c_{l1}) + T_1 + K_1 - p_a c_{a,1} - p_{x,1}\, x_1\right) = 0 \tag{2.30}$$

$$\frac{\partial L}{\partial \lambda} = \alpha\, p_a f\left(x_1, x_2, z^i\right) + w\left(E - c_{l,2}\right) + T_2 - p_a c_{a,2} - p_{x,2} x_2 - (1+r)K_1 = 0 \quad (2.31)$$

$$\frac{\partial L}{\partial \eta} = K^{max} - K_1 \geq 0, \eta \geq 0, \eta \frac{\partial L}{\partial \eta} = 0 \quad (2.32)$$

The equations (2.23 - (2.26) describe the optimal consumption and home time, equations (2.27) and (2.28) the optimal factor input and (2.29), the optimal amount borrowed. As equation (2.19) is an inequality constraint, we use the Kuhn-Tucker conditions in (2.32) and they can be interpreted as follows: credit may or may not be rationed. When the credit is rationed, it has a shadow price η because an increase in credit increases utility. Hence $\eta > 0$. When it is not rationed, it does not bind and the shadow price $\eta = 0$ (Petrick, 2004, p. 80).

2.3.3. The unitary model of household behavior

We consider the households in the agricultural models above as a collection of individuals who have a single decision maker, who decides on the behalf of others. The household acts as one, has common preferences and all household incomes are pooled. In reality however, individual household members have different preferences and the income is unequally distributed. It is difficult to take into consideration the preferences of all household members and not just those of a single member. (Samuelson, 1956) suggested that individual preferences and the pooling of household resources could be achieved by consensus among the household members and the household decision-maker ought not to be a dictator cited by (Alderman, Chiappori, Haddad, & Kanbur, 1995, p. 3). Furthermore, the unitary household models have a shortcoming that, it does not give the methodological approach used to reach the consensus among household members (Bourguignon & Chiappori, 1992, p. 355).

With regard to the case country Cameroon and particularly to its Western Province, it should be pointed out thus, that to avoid conflict within the household, wife and husband do not pool income although they share the same abode or hearth. The husband is known as the head of his family, its protector and decision-maker. He should financially contribute for all major expenses (children school fees, heath care, etc.) and socialize with other men (in practice, this means gather together with other men in local

bars). Consequently, large amounts of money are spent outside the household. The wife is the second head of the family and all her income is to be spent to take care of her family (Silberschmidt, 1999, pp. 111-126). Such situation generally occurs in villages, where women are heavily burdened by their so-called reproductive role, one of them is taking care of the family's food security by cultivating food crops. Men's main farming activities relate to cash crops, which are mainly cacao, coffee trees, and plantains. Since the work pressure is rather seasonal, they appear to have more leisure time as compared to women.

But our study areas are departments and arrondissements (which previously were villages)[11]. Life in departments and arrondissements is different from the village. In villages all women are subsistence farmers whereas in the departments or arrondissements agriculture is considered as the second activity for women (no free land to cultivate) and most of the younger married women do not undertake farm work. They take care of the family (childbearing/rearing responsibilities, and domestic tasks, etc.) and men are supposed to fulfill their role as the head of the family (taking care of everything else). It is assumed that only after women have finished their childbearing lifecycle, they can look for a job and financially contribute to the household. It is in this phase, that couples enter into disagreement of who is responsible for which task in the household. Although women have their own income, they still complain because they want their husbands to continue taking care of everything as they used to do. During the interview, most of the husbands of responding women said that: *We find it normal that married women with own income can take care of themselves and also pay for the school fees of their (our) children".*

The unitary model cannot explain all real-life details. It is therefore necessary to use other models: The collective model which takes into account the preferences of individual household members (Alderman, Chiappori, Haddad, & Kanbur, 1995, p. 5).

[11] In the case at hand, the study areas are referred to villages.

Section-Annex: List of symbols in the economic model

Symbol	Meaning/interpretation
t	time period 1 or 2
q	output produced by the household
p_a	price of the output q
x	input variable
p_x	price of the input factors x
l	labor which is the second input factors
w	price of labor
z^i	fixed factors
π^*	maximum profit
c_a	consumption of the output q, which is produced by the household
y	disposable income
E	total time endowment available
l_s	time worked
c_l	home time $c_l \equiv l_h$
z^h	household characteristics
F	initial endowment of physical and financial remaining capital from the previous period
μ, λ, η	Lagrange multipliers
L	Lagrangean
T	public and private transfers
α	technical change
x_1	input variables that require credit financing (e.g. seed, fertilizer, etc.)
p_1	price of input that requires credit financing
x_2	remainder of input variables that do not require credit financing
p_2	price of input that does not require credit financing
K^{max}	Maximum credit a farmer can receive
K	Demand for credit (the optimal credit demanded may be smaller than K^{max})
r	interest rate of credit
$(1 + r)K$	repayment amount of credit
U	utility function

3. Rural financial markets in Cameroon

Today's rural financial market in Cameroon cannot be understood without referring to and discussing the Cameroonian economy in the 1980s and before.

After 1960, the independence process started and African governments and their people hoped for rapid economic growth and development. The African governments often relied on development advice from the administrative experts and academic scholars of the former colonial powers. This implied little innovation with regard to the recommended development paths, centering on industrialization and Western style modernization – often financed through international debt. In the early decades of independence, growth was timid and thus, the countries were severely affected by the international economic crises in the late 1970s and the early 1980s. In practice Africa's disappointing economic performance has been partly due to internal constraints. Lewis (1954), in his seminal paper on *Economic development with unlimited supplies of labor* and the neoclassical economists have presented the problem of economic development as a transfer of surplus labor from the subsistence or agricultural sector to the capitalist or industrial sector (Ghosh, 2007). Moreover, the World Bank, the *United Nations Development Program* (UNDP), Jeffrey Sachs, Paul Collier and other scholars deeply focused theirs research on the development challenge, in particular on sources of slow growth in Africa. However the Africa lagging growth was exacerbated by the international economic crises. In reaction to the economic crises, many developing countries, notably sub-Saharan Africa had to adopt structural adjustment programs (SAPs), guided by the World Bank and the International Monetary Fund (IMF). One of the major aims of the SAPs was to reduce government expenditures and thus achieve an environment for sustainable economic growth through stable macroeconomic conditions. While proponents of these programs find them essential for sustainable economic growth, critics argue that SAPs did not pay attention to the social dimension of development. Given this situation, rethinking of how to integrate the social aspect (UNICEF called it the 'human face') in SAPs was crucial (Jolly, 2011). By the years 1999/2000, the SAPs were repackaged in form of Poverty Reduction Strategy Papers (PRSP). Within the PRSP, the country governments together with their elite and civil society groups could

determine their appropriate development paths, yet still guided by the World Bank, in order to trigger sustainable growth.

This chapter is structured as follows: The causes of slow growth in sub-Saharan Africa are presented in section 3.1, an overview of economic crises in sub Saharan Africa is given in this section, the regional focus on Cameroon. In section 3.2, an overview of financial sector in Cameroon is outlined and in section 3.3, we will talk about microfinance in Cameroon, its origin, with the focus on the microfinance case analyzed here, namely MC^2 and at the end present the relationship between Cameroonian's government and microfinance.

3.1.Sources of slow growth in sub-Saharan Africa countries[12]

Most African countries became independent in the early 1960s. After the independence, the hope of African leaders was to catch up economically with the industrial nations. Until the early 1970s, there were signs of progress throughout African countries. Large investments were made in infrastructure[13] (roads, ports, telecommunications, etc.), the greatest improvements have been made in development of human resources, in particular medical care (life expectancy has increased); the population was significantly better educated than it had been before the independence. Total school enrollments have grown faster in Africa than in any other developing region since 1960 (See Table 3.1).

Table 3.1: Annual average growth rates (in percent) of enrollments in educational institutions by world developing regions:1960-1976

Region	Primary	Secondary	Higher	Total
Africa	5.7	9.8	10.5	6.2
Latin America	4.8	10.0	10.9	5.9
Asia	3.9	5.0	9.1	4.2
North Africa and the Middle East	4.9	7.6	8.0	5.4

[12] we focus on the sub-Saharan Africa countries because the North African countries have their own distinctive set of economic issues.

[13] IMF recommends investment in infrastructure as the key of development (Abiad, Furceri, & Topalova, 2014).

Source: (Davies, 1980, p. 79): Human development in sub-Saharan Africa

Despite their relative advances since independence, Sub-Saharan Africa's growth has been the weakest compared to other developing regions. The annual average growth was 2.6 percent between 1965 and 1974 and stagnated in most of sub-Saharan Africa in the half of the 1970s. It became negative between 1981and 1986 (World Bank, 1999, p. 17). By the end of the 1980s, sub-Saharan Africa faced even more fundamental problems: high rates of population growth, low level of investments and savings, inefficient use of resources, weak institutions and human capacity, low living standard, etc. (Heidhues & Obare, 2011, p. 56). What accounted for this poor record? Sub-Saharan Africa's lagging growth can be partly explained by external constraints− notably the deterioration of the terms of trade and partly by internal constraints, notably the exchange rates.

The decline in the terms of trade has played a role in sub-Saharan Africa's slow economic growth. The exports of sub-Saharan African countries were (and still are) dominated by primary commodities and their major imports are food items, oil, and manufactured goods. World prices of commodities are volatile and fluctuations in commodity prices lead to fluctuations in real national incomes and pose problems for macroeconomic management (Deaton & Miller, 1996, p. 99). Most of sub-Saharan Africa's disappointing economic performance was due to the deterioration in the terms of trade between 1970 and 1986. The shifting terms of trade in the 1970s was mainly due the two large increases of oil price (in 1973-74 and 1978-80) and the long slide in mineral prices. Sub-Saharan African oil exporters fared much better while non-oil exporters suffered losses of about 30 percent and mineral exporters were seriously hit with losses of about 50 percent (World Bank, 1999, p. 26). Additionally the region experienced slow growth of exports, which had reduced their share of total trade**.** To compensate the income loss due to the deterioration in the terms of trade**,** the region needed additional external transfers**.** These foreign resources have become constrained and the nominal interest rate had increased to record high levels of 18 to 20 per cent during 1980-83 (Cornia, Rolph-van-der-Hoeven, & Mkandawire, 1992, p. 11). In short, the negative terms of trade and the poor performance of export commodities were the source of higher external debt.

The external factors have certainly played a role, but they were not the major constraints for the poor growth record of sub-Saharan Africa. The domestic factors such as poor policies were broadly to blame too. Not only the exchange rates were overvalued, African governments imposed an import substitution strategy with widespread use of

tariffs and bans on presumably non-essential imports. The aim was to protect local industries against competing imports. Additionally, the state was omnipresent in every sector: creating many state-owned enterprises and offering them access to the scarce credit resources; imposing licenses for most economic activities, nationalizing banks, etc. Agriculture, one of the important suppliers of foreign exchange was heavily taxed (World Bank, 1999, p. 26).

Given the situation, African political leaders presented their economic situation to the World Bank and the International Monetary Fund (IMF) asking for an appropriate aid program. As a response to this economic crisis, the World Bank and IMF proposed the above mentioned structural adjustment programs (SAPs). They suggested that the governments of the concerned countries can more effectively achieve their development goals by reducing the widespread administrative control, the over-commitment of the public sector and by developing and relying more on the managerial capacities of the private sector, which can respond more efficiently to the local needs (World Bank, 1981, p. v).The broad objectives of SAPs were to introduce market orientated economic reforms, i.e. to reduce government expenditures and to achieve an environment for sustainable economic growth through stable macroeconomic conditions. The SAPs became also known as Washington Consensus. The original policy package of the early SAPs consisted of: 1. Fiscal discipline; 2. Reorientation of public expenditures; 3. Tax reform; 4. Financial liberalization, 5. Unified and competitive exchange rates; 6. Trade liberalization; 7. Openness to foreign direct investments; 8. Privatization; 9. Deregulation; and 10. Secure Property Rights. As briefly indicated above, the early SAPs came under heavy criticism. Subsequently, a post-Washington Consensus emerged, which contained the first 10 policy targets and ten more: 11. Corporate governance; 12. Anti-corruption; 13. Flexible labor markets; 14. World trade organization (WTO) agreements; 15. Financial codes and standards; 16. “Prudent” capital-account opening; 17. Non-intermediate exchange rate regimes; 18. Independent central banks/inflation targeting; 19. Social safety nets; and 20. Targeted poverty reduction (Rodrik, 2005, p. 974). Since our focus country is Cameroon, we will have an overview of the SAPs in Cameroon.

3.1.1. Structure adjustment programs (SAPs) in Cameroon and their impacts[14]

To understand the origin of the rural financial markets in Cameroon today, the economic history of this country needs to be presented. In Cameroon, the economy grew between 1960 and 1985 due to the expansion of agriculture production and picked up in 1978 with the petroleum production allowing the government to maintain a stable economic environment. Between 1985 and 1988, the economic growth declined due to a fall in the export revenue of agricultural commodities and the diminishing of oil production. The deterioration in economic activity accelerated as a result of continued decline in price of main exports (notably coffee, cacao, cotton and petroleum). The situation was exacerbated by the fact that most of the incomes from exports were expressed in US Dollar, of which the price against the franc of the Financial Cooperation in Africa (franc CFA)[15] dropped. To address the crisis, the Cameroonian's government contacted the World Bank and the IMF, accepting to implement a structural adjustment program (as other African nations did), aimed at stabilization of public finances and stimulation of the economy of Cameroon. The adjustment packages included: reduction of public expenditures on (health, education, rural credit, etc.), redundancies and salary cuts in the public service, devaluation of CFA franc, reduction of the budget deficit through tax increases, liberalization of trade and prices, privatization of public enterprises (Tchoungui, Gartlan, Simo, & Sikod, 1995, p. 109). These measures have impacted the environment and welfare of the population. In the following, the SAP and its impact is presented in detail:

- The reduction of the prices of coffee, cacao and cotton discouraged producers and led to the decrease of outputs. Farmers cut down of plantations and planted food crops.
- The suspension of public support services to rural producers such as input subsidies, extension services, etc. discouraged the producers further.

[14] This sub section has benefitted from (Republic of Cameroon, 2000), (Fouda, 2003) and (Belle-Sossoh, 1997)

[15] The Franc CFA is the currency used in African franc zone. At the center of the franc zone, there are two central banks: the Central Bank of Central Africa (BEAC) with the member countries Cameroon, Republic of Congo, Gabon, Equatorial Guinea, Chad, and the Central African Republic; and the Central Bank of West African States (BCEAO) with member countries Senegal, Togo, Burkina Faso, Côte d'Ivoire, Benin, Niger, Mali and Guinea Bissau. Franc CFA for BEAC and Franc CFA for BCEAO have the same value for its member states.

1 USD ≅ 621 XAF (XAF is the currency code for Francs): http://www.xe.com/en/currency/xaf-central-african-cfa-franc-beac accessed 11th March 2015.

- The closing of state-owned rural credit institutes made access to credit, especially for the agricultural sector more difficult. In Cameroon, before the advent of petroleum production in 1978, agriculture accounted for 30 percent of the gross domestic product and 80 percent of total exports (World Bank, 1989, p. v). Knowing that agriculture is a fundamental instrument for growth and development, after the independence, Cameroon implemented rural credit institutions and agricultural projects[16] such as the *Banque Camerounaise de Développement* (BCD: the Cameroon Bank of Development), *Fonds National de Développement Rural* (FONADER: the National Fund for Rural Development), Crédit Agricole du Cameroun (CAC: the Agricultural Credit Fund), *Office National de Commercialisation des Produits de Base* (ONCPB: the National Marketing Agency Commodities). All these financial intermediaries were owned by the government and were closed due to the banking crisis caused by economic crisis in 1980s. Therefore, most of farmers gave up production of export products (coffee, cotton. cacao) because prices of these outputs had fallen and they could not cover the costs anymore without the subsidized inputs or credit.
- Salary cuts in the public service: this measure exacerbated the poverty in urban areas where most civil servants live.

Salary cuts; the demise of rural financial institutions; the suspension of subsidies; the reduction of public expenditures, privatization of public enterprises had negatively impacted the entire population. As consequences the following could be observed: employment levels declined by 10 percent between 1984 and 1991 with unemployment mainly affecting young people and women and leading to the expansion of the informal sector (Republic of Cameroon, 2000, p. 5). Meanwhile, most enterprises have run to the informal sector to avoid paying taxes. The corruption aggravated in the public sector, the poverty increased and impacted public health levels, food security, education, and other aspects of well-being negatively.

After all, the deterioration of the terms of trade plunged Cameroon into a severe recession, from which the economy emerged only after the devaluation of franc CFA in 1994. The devaluation of franc CFA resulted in a competitiveness gains that reversed the downward trend. The Table 3.2 presents the structure of the economy of Cameroon (1975- 1995).

[16] Agricultural commodities are cultivated in rural areas.

Table 3.2: Structure of the economy of Cameroon (1975-1995)

Average annual growth%	1975-84	1985-95	1994	1995
GDP	9.9	-4.0	-3.8	4.1
Agriculture	6.1	1.3	-3.8	4.0
Industry	23.2	-2.9	-3.8	1.7
Manufacturing	14.7	-2.8	-3.8	7.7
Services	6.2	-8.4	0.7	-0.5

Source: (World Bank, Trend in developing economies, 1996, p. 83) and http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG (accessed, 06th April 2015)

Many African countries have undertaken SAPs in the 1980s to reverse their economic decline and accelerate growth. Despite their efforts, economic growth rates remain low, however raising the question about the efficacy of SAPs they have implemented. The (World Bank, 1999, p. iii) concluded that the progress regarding economic growth was mixed, the level of per capita growth even for countries that have well implemented the SAPs were still below what is needed for rapid poverty reduction. The SAPs were necessary but not enough to raise economic growth and have resulted in rethinking the approach. In their original form, the strict implementation of the SAPs has been abandoned and been replaced by the Poverty Reduction Strategy Papers (PRSP), which address the most current issues−namely the Millennium Development Goals (MDG) (Heidhues & Obare, 2011, p. 61). With regard to the PRSP, the progress reports have to be prepared by the implementing countries, guided by the World Bank and IMF. Again, the PRSPs ought to promote broad-based growth and reduction of poverty[17]. Cameroon, like many other developing countries adopted and implemented the PRSP with the main objective of achieving the MDGs in 2015. The central question was how would the MDGs be achieved with the mountain of debts in Cameroon and other sub-Saharan African countries accumulated during the economic crises? However, countries with a high level of debt were classified as Heavily Indebted Poor Countries (HIPC), which led them to benefit from debt relief if they adhered to certain conditions. Once the debt was relieved, the creditors (the World Bank, IMF and bilateral partners) thought that the success of the poverty reduction program (PRSP) will depend heavily on good

[17] http://www.imf.org/external/np/prsp/prsp.aspx (accessed, 20th March 2015)

governance. We are already in 2015, efforts have been made but still the MDGs are not achieved. What went wrong?

Table 3.3: Cameroon: Progress towards MDG

Goals of the Millennium declaration	Achievement	Government assessment of progress
1-Eradication extreme poverty	According to UN Human Development Report 2011, the number of people living with less than 1.25 USD has dropped from 40.2 to 39.9 percent (from 2002 to 2011)	unlikely
2-Achieve universal primary education	Enrolment in primary education was 83 percent between 2001 and 2007. The literacy rate for 15-24 year olds was 83 percent.	Potentially achievable
3-Promote gender equality and empower women	Between 2001 and 2007, the ratio of girls to boys across primary, secondary and tertiary education was 0.7. The share of women in paid employment outside agriculture is only 27.3 percent. Women constitute 18 percent of the 360 municipal council mayors and held 13.9 percent of seats in parliament from 2007 to 2013.	Potentially achieve
4-Reduction child mortality	Between 2004 and 2010, the mortality rate of children aged below five years dropped from 144 to 136 per thousand.	Unlikely
5-Improve maternal health	In 2004, maternal mortality rate was 669 per thousand live births and has increased to 1000 per thousand in 2010.	Unlikely
6-Combat HIV/AIDS, malaria and other diseases	According to the government progress report for 2008, malaria prevalence rate was 15 percent in 2005, down from 40 percent in 2004. HIV/AIDs prevalence rate was 5.5 percent in 2004 with the higher rate in urban areas.	Unlikely, but potential to meet malaria targets
7-Ensure environmental sustainable	The proportion of the population having access to drinking water increased from 50 percent in 1990 to 74 percent in 2008. The environmental degradation in Cameroon has increased.	Unlikely
8-Develop a global partnership for development	The partnership basically targets inter alia: mastering and reducing youth unemployment, popularizing the use of communication and information technology, reducing gender inequality. Youth unemployment dropped from 14.3 to 8.2 percent between 2001 and 2007.	Probably

Source: adapted from (Commonwealth Foundation, 2013, pp. 7-10) and (IMF, 2010, pp. 36-7)

3.1.2. Sub-Saharan Africa: other obstacles for economic growth[18]

Since Africa got the independence, the unique question often asked, is about the causes of their slow growth. This question has generated the ongoing debate, which has offered many explanations. Africa is a continent rich in raw material but the poorest continent of the world. How can this paradox be explained? The region's continued disappointing economic performance is due to many causes; frequently mentioned causes are (among others) conflicts, curse of mineral resources, climatic and geographic factors, rapid growing population, bad governance and globalization.

The conflicts trap: Because Africa is the epicenter of low income and slow growth, it has become the epicenter of *coups d'état* and civil war (Collier, 2007, p. 36). He added that the continent does not have a lot of conflicts because it is Africa, but because it is poor. Once a country has had a conflict it is much more likely to have another conflict, a phenomenon called conflict trap. Based on data from the University of Michigan, Collier showed that 73 percent of the poor societies have recently been through a civil war or are still in one. In a country, when people cannot meet basic needs for survival or basic needs are met but just barely, they are desperate and hopeless. So poverty makes countries prone to the war.

Africa is a continent with abundant natural resources and permanent conflict. Is there any correlation between natural resources and conflicts? (Collier & Hoeffler, 1998) found that natural resources increase the risk of civil war. This is justified by rebel movements. The main objective of rebellion is to capture the state. The military infrastructures available to rebels are fairly narrow compared to the government ones; and international companies usually advance massive amounts of funding to rebel movements in return for resource concessions in the event of rebel victory (Collier, 2007, p. 21). Ethnic dominance is also known as a source of conflict (genocide in Rwanda for example).

War damages the country itself and the neighbors. It kills people, destroys infrastructures, slows growth, creates refugees, etc. The survivors die due to the collapsing of the health care system. In short, the costs of war are enormous. Economically, it leaves the country poorer than it would have been. War is development in reverse.

[18] This sub-section has benefited substantially from (Collier, 2007)

The curse of natural resources: In reality the discovery of mineral resources would be considered as the catalyst to the prosperity, the engine for growth. But this is exceptional. On the contrary the natural resources may increase conflicts (but even countries living in peace fail to grow). This paradox is hard to understand. If the natural resources do contribute to the development, why is Africa still the poorest continent? How can we explain that countries with abundant resources have not experienced sustained economic growth? What accounts for this paradox?

Economists called this paradox the" Dutch disease" which is explained by the fact that the increase in resource exports causes the currency of the country to rise in value against other currencies. This makes the country's other export activities uncompetitive (and imports more attractive). Yet these other activities might have been the best tools for technological progress (Collier, 2007, p. 39). There are others reasons to explain this paradox. Collier sees the abundance of natural resources as a trap. The incomes generated by mineral resources appear to mess up politics. Using the data from the World Bank, (Collier & Hoeffler, 1998) estimated the rents (the excess of revenues over the costs generated from natural resources) and controlled the share of public expenditure in national income and realized that resource surpluses appear to reduce incentives for development orientated politics. An abundance of resource rents may also be used for an unfair financing of electoral campaigns. Governments are so fixated on winning the next election that they neglect what might happen afterward, and therefore overlook investments that only come to fruition in the future (Collier, 2007, p. 44). (Sachs & Warner, 2001) added that there may be biases resulting from unobserved growth deterrent that could also explain this paradox.

Climate and geography: Climatic and geographic characteristics may play a significant role in Africa's slow growth. Sub-Saharan Africa is preeminently tropical. The tropical climate is hostile to bacterial and to endemic diseases such as malaria. The disease is source of lower productivity (for instance the Ebola disease has had severe implications for food and cash crop production in Liberia, Sierra Leone and Guinea). The soil quality is poor and the continent is almost semi-arid with less reliable rains.

Geography has also played a role: countries that are geographically isolated from world markets face high costs for international economic activities. Landlocked countries face high costs of shipping. Landlocked countries' access to the sea depends upon their neighbors. They must pay road transport costs in addition to the sea freight costs. (Collier, 2007, p. 55) argued that landlocked countries depend on their neighbors not just as

transport costs to overseas markets but also directly as markets. Taking the example of Switzerland and Uganda, he compared Switzerland which has Germany, Italy and Austria as neighbors to Uganda, surrounded by Kenya which has a stagnant growth, Sudan which is involved in a civil war, Rwanda which had genocide and its consequences, Somalia which is completely collapsed, Tanzania and others. In short, some neighbors are better as markets than others. All these factors handicap the economy.

Population growth: Robert Malthus hypothesized that uncontrolled population growth will exceed resource growth leading to overpopulation and social problems. This would occur because population grows exponentially while resources grow arithmetically. Land is no longer abundant to cultivate and the effects of global warming are affecting sub-Saharan Africa also in such a way that agriculture suffers. In sub-Saharan Africa, population growth may have a negative impact on food security. Rapid population growth contributes also to movements from the rural to the urban areas in search of a better life. The demographic boom creates special needs for the provision of basic public services. The number of children to be educated increase and government is obliged to invest more in school otherwise lack of schools will lead to illiteracy, which is already an issue in Africa. But (Simon, 1981) in his book entitled: "*The Ultimate Resource*" is the economist who challenged Robert Malthus theory on population growth, raw material scarcity and resource consumption. Simon argued that population growth is not a danger as Malthus thinks. On the contrary population is the solution of resource scarcity and environmental problems because people may develop appropriate innovations (more people mean more talents, more innovation and inventions). But is it really the case in Africa? Africa's intellectuals who are supposed to be markets innovation are outside their countries.

Globalization: the globalization is multidimensional impacting all sectors of life, namely cultural, economic, political, social and environmental spheres across international boundaries. However, with the concept of globalization, the gap between developed and developing countries has become large in recent decades. Parts of Africa seem not to benefit from globalization. It has reinforced its economic marginalization. The marginalization is reflected in their small share of world trade (barely 2 percent), output (not much higher), and foreign direct investment (1 percent)[19].

[19] http://www.imf.org/external/pubs/ft/fandd/2001/12/daouas.htm (accessed ,20th February 2015

Many scholars agree that the above factors are obstacles for growth in sub-Saharan Africa and added that many countries are not yet well prepared to benefit from economic opportunities due to globalization. They argue that the cooperation between francophone African countries and France may not always be beneficial for African growth. For instance, (Agbohou, 1999) in his book entitled" *Le Franc CFA et l'EURO contre l'Afrique" (in English Franc CFA and EURO against Africa)* presented a set of arguments showing that no African country can achieve the status of emerging country using the Franc CFA. This is mainly because about fifty percent of their external reserves are kept in an account held by the French treasury. He appeals African countries using the Franc CFA to leave this currency and create their own currency which is managed by them and used for their own interests. This could lead to a devaluation and thus more competitive leverage in international trade.

Bad governance is also blamed for the lack of development in sub-Saharan Africa. Good governance (as opposed to bad governance) is associated with "democracy and good civil rights, with transparency, with the rule of law, and with efficient public services": the World Bank[20]. But is good governance effective in terms of growth? (Collier, 2007, p. 64) argues that good governance has a positive correlation with economic growth but there is a ceiling to possible growth rate at around 10 percent. Good governance along is not sufficient for development, it should be accompanied by the macroeconomic stabilization (Meisel & Aoudia, 2008, p. 4).

(Lewis, 1992) added that in Africa people are too spendthrift and the religion too worldly cited by (Ghosh, 2007, p. 22).

3.2. Rural financial sector in Cameroon: an overview

Cameroon, member of the franc zone, is one of the countries of the Central African Economic and Monetary Community (CEMAC), together with the Republic of Congo, Gabon, Equatorial Guinea, Chad, and the Central African Republic. At the center of the franc zone system is the Central Bank of Central Africa (BEAC) that issues the Central African CFA franc (Financial Cooperation in Africa), the common currency for its six

20 http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/MENAEXT/EXTMNAREGTOPGOVERNANCE/0,,contentMDK:20513159~pagePK:34004173~piPK:34003707~theSitePK:497024,00.html (accessed, 18th May 2015)

member states. Together with the six member countries of BEAC, the eight member countries of the Central Bank of West African States (BCEAO) belong to the African franc zone. These are Senegal, Togo, Burkina Faso, Côte d'Ivoire, Benin, Niger, Mali and Guinea Bissau. The common currency, the Franc CFA is fully convertible into the French Franc (FF) at a fixed exchange rate. This fixed exchange rate has been 1 FF = 50 Franc CFA up to 1994. After the devaluation of Franc CFA in 1994, 1 FF was 100 Franc CFA. With the creation of Euro zone in 1999, The French Franc doesn't longer exist but the Euro. Now 1 Euro equals 655.957 Franc CFA[21].

BEAC was created in 1972 as a successor of the Central Bank of Equatorial Africa and Cameroon (BCEAEC) that had been created in 1953. The mission of BEAC is to define and carry out monetary policies of the member countries, to manage exchange operations, exchange reserves, and to promote the efficient operation of payment systems[22]. As a result of economic and banking crises, reforms were implemented to better regulate the banking system. For example the Central African Banking Commission (COBAC) was created in 1992 and it is the only body responsible for supervising the formal banking intermediaries in CEMAC countries.

3.2.1. Formal financial intermediaries

The early forms of rural financial intermediation were largely based on the assumption that we face a vicious poverty cycle, particularly in rural areas. People are assumed to be poor, because they are poor, they cannot save, because there are no savings, there are little investments, due to a lack of investments, productivity is low, income growth is low, and people remain poor. To overcome this vicious cycle, government has to break the low savings-low investment relationship by making available credit at advantageous terms. Therefore after the independence, the Cameroonian government created the Cameroonian Development Bank (BCD), a state-owned development bank, which had as main objective, ensuring the distribution of credit in rural areas in order to stimulate development. The National Fund for Rural Development (FONADER) came into live in 1973. FONADER was supposed to distribute subsidized agricultural inputs, agricultural credit, and financing and monitoring of specific development projects. In 1976, the National Marketing Agency Commodities (ONCPB: Office National de

[21] http://www.xe.com/ucc/convert.cgi (accessed, 12th March 2015)

[22] http://www.beac.int/index.php/billets-et-pieces/missions-de-la-beac (accessed ,20th January 2015)

Commercialisation des Produits de Base) was created to mobilize funds from export tariffs. These funds were channeled to FONADER and its development projects. These rural credit institutes and agricultural projects were demised due the banking restructuring in 1990/1992 that led to their liquidation. The government experimented with different forms of financial intermediaries destined to the poor since 1991:

- The state-owned but commercial bank *Crédit Agricole du Cameroun* (CAC: Agricultural Fund for Cameroon) founded in 1991, was the official governmental credit intermediary, which had as mission, the administration of credit provided by international organizations, namely the World Bank, the African Development Bank (BAD), and other donors (Schrieder, 1996, p. 83). CAC founded its first village bank (local village bank) in 1991 to finance rural and agricultural projects by the year 1995/1996. The devaluation of Franc CFA in 1994 has led to the second banking reform between 1996 and 1999 and this time CAC was liquidated.
- The commercial bank *Caisse Commune d'Epargne et d'Investissement* (CCEI Bank), now known as Afriland First Bank, started its activities in 1987 and initiated the rural and urban banking. The rural version is called *Mutuelles Communautaires de Croissance*' (MC^2: the Community Growth Mutual Funds)[23] and was created in 1992 and the urban version is called *Mutuelle Financière des Femmes Africaines* (MUFFA: Women Investment Club) came into live in 1999 (Tchepannou, 2002). It is generally stated that women represent 70 percent of the world's poor (UNDP, 1995, p. iii). They continue to lack voice and decision making capacity and their economic opportunities remain limited in many parts of the world. Because MC^2 is located in rural areas and offers its services to women and men, Afriland First Bank found it necessary to initiate another version in urban areas (MUFFA), which is only concentrating on women. Both MC^2 and MUFFA receive technical assistance by the non-governmental organization (NGO) called Appropriate Development for Africa Foundation (ADAF). The state initiated financial intermediaries were asked not to compete with the Cameroon Cooperative Credit Union League (CamCCUL) but act as a complement. CamCCUL, the Anglophone credit union movement in Cameroon provides credit to a clientele that has no access to commercial banks and was created in 1968 by a priest as a self-help initiative. Obviously, it has received substantial

[23] This study was conducted in Cameroun with MC^2 as our case study (See section 3.3.3 for more details on the presentation of MC^2 network).

attention by international donors since and has seen a relative steady and sustainable expansion path, primarily in the Anglophone part of Cameroon.

3.2.2. Informal financial sector

The informal financial sector comprises all financial transactions, loans and deposits, occurring outside the regulation of the financial market authority, the central bank; and the regulated activities are considered as formal finance (Adams & Fitchett, 1992, p. 2). Informal finance has a long history in low-income countries. The informal financial sector is composed of actors such as:

- Family or friends: members of the family or friends can decide to have a fund, where everyone regularly contributes to meet the family or friend needs.
- Moneylenders: people who have enough financial resources and decide to make them available to those who are in need. They ask for collateral and the interest rate is generally high, mainly due to high transaction costs of funds and substantial lending risks.
- Non-rotating and rotating savings and credit associations (non-RoSCAs and RoSCAs): these types of actors mainly offer services such as savings and (rotating) credit. In French speaking countries, the rotating form of self-help financial association is called *tontine* but there are many labels across countries.

The informal financial sector has a long history in Cameroon. The economic crisis of the 1980s in Cameroon had amplified the use of informal financial services. Despite all efforts by the government to strengthen the formal financial sector, the lack of access by the poorer population segments to sufficient formal finance was evident.

In the following, we focus on RoSCAs (*tontines*) because it is the most elaborated informal financial self-help form and omnipresent in Cameroon and elsewhere. The RoSCAs are ubiquitous in rural areas and very developed in urban environments. Although a few participants may encounter problems in repaying their debts, the majority honors their debt obligations and RoSCAs make thus important contributions to development. As the informal and formal financial sector obviously cater for different population segments and the informal suppliers serve the so-called unbankable from the perspective of the formal financial sector, these two sectors do not compete but supplement each other. RoSCAs provide also other services to participants besides loans and savings. They provide some form of social and insurance capital as their aim is to

assist each other financially and socially in good and bad circumstances. In the study region for this work, 84.6 percent of members of MC[2] are also members of RoSCAs. The particularity of RoSCAs is as follows:

- low transaction costs for those who offer and demand financial services;
- the procedure to obtain the loan is not complex;
- physical collateral is largely substituted by joint liability and confidence in character;
- a social service association;
- but high interest rates.

RoSCAs mostly offer services such as savings and (rotating) credit; and a good in kind is bought once a year with the accumulated loan interest and distributed among the eligible members. The confidence between members is considered as collateral and if one of the members cannot refund her/his loan, this confidence is broken and may affect their relationship.

3.3. Microfinance in Cameroon[24]

The roots of microfinance intermediaries in Cameroon can be traced back to the credit union that was created in the Anglophone zone of Cameroon in Njinikom in 1963 by Reverent Father Anthony Jansen from Holland. The movement spread all over the North West and South West regions and led to the creation of the Cameroon Cooperative Credit Union League (CamCCUL) in 1968 (Fotabong, 2012). The label microfinance[25] really took off in the 1980s although early experiences date back to the early 1970s in Bangladesh with the Grameen Bank. The origin of microfinance in Cameroon can be also related to the economic crisis in the late 1980s that led to the demise of branches of state-owned commercial and development banks and prompted the government to create the law N°. 90/053 of 19 December 1990 relating to freedom of associations and the law

[24] This subsection was mainly based on the work of Fotabong (2012): "The Microfinance Market of Cameroon: Analyzing trends and current developments" and Ruffing (2009):"Cool Head, Warm Heart: Governance and the Mission of Microfinance in the Case of MC2 Micro-Banks, Cameroon".

[25] Microfinance refers to various services, not only microcredit but also savings or insurance services, payment services, and transfers, for instance of remittances.

N°.92/006 of 14 August 1992 relating to cooperatives, companies and common initiative groups (COOP/GIC).

In Cameroon, the majority of MFIs offer mainly three services such as: savings, microcredit and money transfers. Micro-insurance, mobile money and others services are still at the experimental stage. The interest rate charged by MFIs is not identical since the government did not fix the interest rate ceilings. It varies from one MFI to another. The annual interest rate paid for savings varies from 3.25 percent up to 15 percent, and 30 percent and more is charged for credit. Because of subsidies, the maximum annual interest rate charged on credit is 15 percent in the microfinance MC^2, it is thus in the medium range in Cameroon. MFIs always cooperate with commercial banks, mainly for financial reasons−namely transfer of fund and refinancing. MFIs transfer the surplus of their savings to the bank mainly because banks (located in the city) are good place to secure the money as compared to the MFIs located in rural areas. This relationship can be also technical (the bank can provide its infrastructures to the MFI). For example the following alliances exist at present:

- Afriland First Bank collaborates with the microfinance intermediaries *Mutuelle Financière des Femmes Africaines* (MUFFA: Women Investment Club), the urban intermediary and the rural intermediary, known as MC^2;
- CamCCUL and the Union Bank of Cameroon (UBC);
- International Bank of Cameroon for Savings and Credit (BICEC: *Banque Internationale du Cameroun pour l'Epargne et le Crédit*) with the Agency for Private Enterprise Credit in Cameroon (ACEP: *Agence de Crédit pour l'Entreprise Privée du Cameroun*) and *Caisses Villageoises d'Epargne et de Crédit Autogérées* (CVECA: Self Directed Village Savings and Credit).

3.3.1. Regulation of microfinance in Cameroon

After the law N°.92/006 of 14 August 1992 relating to cooperatives, companies and common initiative groups (COOP/GIC), the rapid growth of MFIs in Cameroon needed a framework to regulate the microfinance sector in order to secure the savings of their clients. With the law of 1992, there was no control mechanism of the central bank because MFIs were placed under the supervision of the Ministry of Agriculture and under the law N°. 90/053 of 19 December 1990 relating to freedom of associations (linked with the Ministry of Territorial Administration) states (Djoum K. S., 2008, p. 4). Given the

situation, the decree of 98/300 of September 1998 was created to revisit the law of 1992; and the control, supervision and the right to dissolve MFIs (if they don't adhere to the regulations) were transferred to the Ministry of Finance (which has the monetary authority) and COBAC. In order to provide a most suitable regulation, it was necessary to categorize MFIs. The regulation became effective in 2002. MFIs are divided into three categories[26]:

1. Category one: organizations that collect savings and deposits and lend them to their members. There is no requirement capital but a minimum capital adequacy is needed. This category of MFIs must keep reserves to cover losses. Examples for this category are the MC^2 and CamCCUL.
2. Category two: organizations that collect savings and deposits and lend them to members and non-members. The minimum capital required is Franc CFA 50 million (about 80 515 USD). A bank statement must be presented as proof of this amount from any of the commercial banks.
3. Category three: organizations that do not collect savings and deposits but exclusively provide credit to clients, whereby these clients do not need to have necessarily deposits in this organization. The minimum capital requirement is Franc CFA 25 million (about 40 258 USD). A bank statement must be presented as the proof of this amount from any of the commercial banks.

Since the regulation is made by the COBAC, this implies that the six countries under CEMAC are concerned. COBAC has made progress in strengthening a general regulation in microfinance sector, although some MFIs are still collapsing. In Cameroon for instance, Microfinance institutions such as GBF (*Goldy Bussinessmen Fund*) has closed in 2008; COFINEST (*Compagnie financière de l'Estuaire*) in 2011; FIFFA (*First Investment For Financial Assistance*) in 2012 and CAPCOL (*Caisse Populaire Coopérative du Littoral*) in 2012. The main cause of collapsing is due to the non-compliance with the regulations in force (Okah-Efogo & Okah-Atenga, 2013).

3.3.2. Presentation of CamCCUL network

Discussing the Cameroonian microfinance sector without including the Cameroon Cooperative Credit Union League (CamCCUL) gives an incomplete picture. As

[26] https://www.beac.int/index.php/supervision-bancaire/reglementation-de-la-microfinance (accessed February 03,2015)

mentioned above, the first microfinance cooperative was established by rev. Father Anthony Jansen, a Roman Catholic Priest from Holland in the Anglophone zone of Cameroon in 1963 in Njinikom. Credit Unions spread to other areas of the region and led to the formation of CamCCUL in 1968. CamCCUL is a pioneer of microfinance in Cameroon with a very strong reputation and credibility (Fotabong, 2012). It remains a leader in terms of customers, outreach and branches (350 service points spread in ten regions) (AgriFin, 2011)[27]. The CamCCUL network created its own commercial bank in 2000, the Union Bank of Cameroon. CamCCUL is open to all persons requesting its services. Its objective is to fight poverty specifically by serving clients who are rejected by the traditional commercial bank sector.

3.3.3. Presentation of MC^2 network[28]

Organization of the MC^2 network: the microfinance MC^2 came to live in 1992 thanks to the dynamic and ingenuity of urban and traditional elite in west Cameroon. With the economic crisis in the 1980s, the Cameroonian government has withdrawn from the agricultural sector leaving the poor to their own fate. Given the situation, Dr. Fokam K. P. thought about how to implement a formal financial window that responds to the needs of people living in rural areas, who have no access to commercial banks. After a long reflection, he realized the idea of developing the microfinance intermediary known as MC^2 in rural areas in 1992. The microfinance MC^2 got its name from the formula: Victory over Poverty (VP) can be achieved if the Means (M) and the Competitions (C) of the Community (C) are combined. Hence the formula:

$VP = M \times C \times C = MC^2$. His idea was that the creation of MC^2 should be based on various stakeholders:

- The inhabitants of the villages are the only people to take the initiative to create a new MC^2. The network of a MC^2 is defined as the village bank created, owned, controlled, and managed by the people of the community according to their local values, traditions, and customs.

[27] World Bank (2011): Cooperative Credit Union League Ltd. – MFI CamCCUL. Washington, DC, World Bank & Agriculture Finance Support Facility (AGRIFIN)

[28] The main part of this subsection is based on (Mees & Bomda, 2001) and (Fotabong, 2012).

- The Afriland First Bank is the real driving force of the MC^2 network. The Afriland First Bank has the role of training of agents of MC^2 to banking systems, refinancing the MC^2 network, controlling of ratios and cash security.
- The MC^2 network is supported by the NGO called the Appropriate Development for Africa Foundation (ADAF). This NGO is responsible for accountancy control and reconciliation of the accounts and can also train the staff of MC^2. It is an intermediary with national and international aid and commercial organizations.

MC^2 offers financial services such as microsavings, microcredit, microinsurance, mobile money, money transfer:

- The ordinary savings account is accessible to every member, but demands a general minimum average investment of 5 000 Franc CFA (about 8 USD). The savings interest rate is between 2.5 and 4 percent per annum, which is less than in commercial banks (5 percent per annum).
- The associated deposit account is the current account which must have at all times a minimum deposit of 10 000 Franc CFA (about 16 USD). A holder of such an account can operate everywhere in Cameroon and even outside the country.
- The flash cash account created by Afriland First Bank, requires an initial investment of 25 000 Franc CFA (about 40 USD) and it includes travelers checks.

Analysis of loans granted: the procedure to obtain a loan is not trivial. A new member is observed during six months and then if she/he introduces a request for a loan, an interview is organized with the manager of MC^2 and her/his home will be visited. The credit committees meet only once every three months. For urgent cases, the credit committees occur but up to a certain credit threshold. Prior savings and the provision of collateral are compulsory for borrowers to have access to credit. The collateral can be the house, land, an object with a strong symbolic value or the joint liability of a group in which all group members are jointly liable[29]. Not only savings and collateral are indispensable to obtain the credit, but the use of funds (project for which the loan is requested) is very crucial. The project presented will largely determine the capability of repayment. Most of the loans are directed towards productive activities. In order to avoid its members turning to usurers or RoSCAs for urgent needs (because they charge much

[29] With the joint liability group lending, if one member of the group does not repay her/his loan, others have to contribute to ensure the repayment. No repayment by the group means that the entire group will be denied future access to loans.

higher interest rates), the MC^2 offers social loans for children's education, rehabilitation of houses, funerals, weddings, health care, etc.

Nevertheless, in the study region for this work, 84.6 percent of members of MC^2 are also members of RoSCAs. The reasons given for this dual membership are: *the credit is constrained and the procedure to obtain a loan is very long and complex in MC^2. Furthermore RoSCAs provide other services to their participants that MC^2can not offer. Members of RoSCAs financially and socially assist each other in good and bad circumstances.* These are the main reason why microfinance and RoSCAs remain complementary.

The average annual interest rates charged on credit in MC^2 network are 13 percent, which are much lower than those from the informal financial sector. The reimbursement rate of loans reaches 97 percent in MC^2. Table 3.4 gives an overview of MC^2 network services.

Table 3.4: An overview of MC^2 network services in Cameroon

	2007	2008	2009	2010	2011
Number of MC^2	68	75	79	84	90
Number of clients	86 829	97 468	115 365	132 097	149 159
Savings (in thousands of F CFA)*	14 985 599	19 275 151	23 687 317	28 481 581	30 901 725
Outstanding credit (in thousands of F CFA)	6 134 462	7 636 083	10 297 539	12 648 077	14 035 543
Doubtful debts	…	…	981 010	1 299 303	1 509 720
Net operating profit (in thousands of F CFA)	205 162	183 591	486 252	371 899	439 843

Source: ADAF (2012)

Notes: … Data are not available

* in 2013, savings were around 34.4 billion Franc CFA

1 USD ≅ 621 XAF (XAF is the currency code for Francs): http://www.xe.com/en/currency/xaf-central-african-cfa-franc-beac, accessed 11th March 2015

Fighting poverty is the real objective of MC^2. But only science based empirical studies can confirm it. To know whether MC^2 has had a positive impact or not, academia should *simultaneously* evaluate its impact on the outcome variables such as household income, children education, food consumption, management of household emergencies (sickness, natural catastrophes, etc.), managing of large household expenditures (funerals, weddings, etc.). Microfinance in the form of MC^2 has certainly a positive

impact since its services are highly in demand. However MC^2 doesn't only focus on the poor but on the entire population, including urban elites. The elites are those capable to present reliable collaterals. But including urban elites may lead to a mission drift of MC^2. That is diverting from its social objective.

In 2012, the time of the survey, the MC^2 networks had 92 agencies in Cameroon. The outreach of the MC^2 network is measured by the number of clients. Does microfinance within MC^2 serve the poorest? Can these poor people improve their economic situation due to MC^2 services? Only research can answer this question. [30]

3.4. The Cameroonian government's role in supporting microfinance

Cameroon hopes of achieving the emerging country status by 2035 and to meet this objective, it must reduce poverty (Republic-of-Cameroon, 2009). Almost 40 percent of its populations are poor (absolutely poor). These poor live mostly in rural areas and largely dependent on agriculture, which is a fundamental instrument for sustainable development, poverty and hunger alleviation. Therefore strengthening rural development is very crucial. However the Poverty Reduction Strategy Papers (PRSP) was elaborated and implemented; and allowed the country to reach the completion point in 2006 under the Heavily Indebted Poor Countries (HIPC) Initiative, which enabled Cameroon to benefit from debt relief. Cameroon was eligible for HIPC Initiative because of its high level of debt. PRSP has enabled the country to maintain the macroeconomic stability and sustain positive growth rates until 2008. Later on Cameroonian's government decided to update the PRSP and attached great importance to the creation of welfare through the creation of formal employment to boost the growth. This has led the government to draw up a new Growth and Employment Strategy Paper (GESP) in 2009 in order to tap the country's major development potential which covers the period 2010-20. The GESP is built on a long term vision extending to 2035. It also underlines the Government's commitment to achieve the Millennium Development Goals (MDG). The Vision 2035 (become an emerging economy by the year 2035) has four main objectives: (a) reducing poverty to a socially acceptable level, (b) becoming a middle- income country, (c) being an industrialized nation and (d) strengthening national unity and consolidating democracy

[30] With the exception of the objective of MC^2 network, the rest of this subsection was based on (Mees & Bomda, 2001): "The Mutuelles communautaires de croissance (MC2) Cameroon: Zoom microfinance."

(IFAD, 2012). To achieve these objectives, five areas have been identified: infrastructure development in energy, telecoms, and transport; development of the rural and mining sectors; increase in human resources through education, health, and training; greater regional integration and export diversification; and strengthening and deepening the financial sector (IMF, 2010, p. 2).

Developing the rural sector means render the institutional environment in rural areas conducive through rural development projects such as infrastructures (roads); human resources (education, health); programs for agriculture growth, particularly a sustainable financial intermediary catering to agriculture. These measures are thought to be an important development strategy. However, Cameroonian's government and its bi- and multilateral partners have set up programs to finance rural development. Knowing that agriculture is the main source of income and employment for 70 percent of the world's poor living in rural areas, that in sub-Saharan Africa, 64 percent of the rural population depends on agriculture (World Bank[31], 2011), that in Cameroon 40 percent of the population are extremely poor and most of them live in rural areas and dependent mainly on agriculture, therefore putting more consideration on agricultural diversification and productivity, in particular to attain food security is very crucial. The government with the support of the International Fund for Agricultural and Development (IFAD)[32] has launched the Rural Microfinance Development Support Project (PADMIR) in January 2011 for a period of six years. As usually, it shall enable the poor people to overcome poverty. The Microfinance Network in Cameroon (ANEMCAM: *Association Nationale des Etablissements de Microfinance du Cameroun*) is equally supported by the United Nations Development Program (IFAD, 2012). A part from the IFAD funds, the government uses Heavily Indebted Poor Countries (HIPC) funds to grant microfinance. What is the HIPC fund?

Cameroon's external public and private debt had drastically increased with the economic crisis in 1986. Cameroon like other sub-Saharan Africa countries could not repay their debts. The interest rates of these debts accumulated with the time and Cameroon was considered a Heavily Indebted Poor Country (HIPC). The HIPC Initiative is an economic and financial program launched by the G7 in Lyon (1996) to provide debt

[31] http://donnees.banquemondiale.org/theme/agriculture-et-developpement-rural (accessed June 12, 2013).

[32] http://operations.ifad.org/web/ifad/operations/country/project/tags/cameroon/1362/project_overview (accessed 21st May 2015).

relief for heavily indebted poor countries[33]. Cameroon beneficiated from its debt relief in 2006 under one condition: using the debt relief called "HIPC funds" for development orientated initiatives. That is improving public services in education, health, social development, urban sanitation and rural development. The objective of the HIPC Initiative was to reduce the debt of concerned countries at a sustainable level hopping they will achieve the Millennium Development Goals (MDG) in 2015. The government uses these funds for instance to subsidize loans in MFIs located in rural areas. This is the main reason why the average interest rates charged on credit is rather low, with 13 percent per year in MC^2 network. Nevertheless, keeping in mind the very low average annual inflation rate since 2002 (2.37 percent), the real credit interest rate of MFIs is still quite substantial. The government also supports MFIs by setting a framework to regulate the environment of microfinance in order to secure the consumers' servings.

We mentioned in chapter two, however, that the longer a MFI is subsidized, the greater the danger, that it will never become sustainable. Therefore the government provides them limited subsidies (so that the poor can be served) and trying to maintain the economic stability with the conducive institutional environment in order to attract investors and the concurrence in rural financial sectors.

We are already in 2015 and Cameroon did not achieve the MDGs. Poverty has not been eradicated. Much has certainly been realized. Despite efforts by the government during the past decade, the Cameroonian economy has been growing between 2 and 5 percent. At this pace one wonders if Cameroon will achieve its objectives in 2035. The reality is that much remains to be done. Nevertheless let us have an overview of Cameroon current basic economic indicators.

[33] The members of G7 are Germany, France, the United Kingdom, Italy, Japan, Canada and the United States of America: Source Wikipedia

Table 3.5: Cameroon current basic indicators in 2013: comparative levels (selected countries)

Countries	Popula-tion in million	GDP per capita US dollars	GDP growth rate in %	GDP growth rate in % between 2005-2013		Average annual inflation rate in %	Adult litera-cy* %	Life expec-tancy at birth (years)**	HDI*** (2011)[34]
				Min	Max				
Cameroon	22.2	1,328.6	5.6	1.9	5.6	1.9	71	55	0.498
Other Sub-Saharan Africa countries (SSA)									
Nigeria	173.6	3,005.5	5.4	3.4	8.2	8.5	51	52	0.496
Ghana	25.9	1,858.2	7.6	4.0	15.0	11.6	71	61	0.566
Ivory Coast	20.3	1,528.9	8.7	-4.4	10.7	2.6	41	50	0.443
Kenya	44.3	1,245.5	5.7	0.2	8.4	5.7	72	61	0.527
Ethiopia	94.1	505.0	10.5	8.8	12.6	8.7	39	63	0.422
Chad	12.8	1,053.7	4.0	0.1	13.6	0.1	37	51	0.365
Others developing countries									
Nepal	27.8	694.1	3.8	3.4	6.1	9.0	57	68	0.533
Bangladesh	156.6	957.8	6.0	5.0	7.1	7.5	59	70	0.549
Pakistan	182.1	1,275.3	4.4	1.7	7.7	7.7	55	66	0.531
Ecuador	15.7	6,002.9	4.6	0.6	7.9	2.7	93	76	0.705

Source: World Development Indicator: http://www.worldbank.org/ (accessed February 11, 2015)

Notes: Data from 2014 are not yet available.

Adult literacy rate is the percentage of people ages 15 and above who can read and write.

* Data are from years others than 2013

** Data are from 2012

****The united Nations Development Program* (UNDP) classification system based *on Human Development Index* (HDI), a composite index of three indices measuring countries' achievements in *longevity, education and income*.

$0 \leq HDI \leq 1.4$

Very high human development: $HDI \geq 0.793$ (2011)

High human development: $HDI \geq 0.689$ (2011)

Medium human development: $HDI \geq 0.522$ (2011)

Low human development: $HDI \geq 0.286$ (2011)

*** Cited by Matthias Blum, Lecturer of Development Economics, TUM, Germany

[34] http://hdr.undp.org/en/countries (accessed April 07, 2015)

Table 3.5 indicates that between 2005 and 2013 all selected SSA countries registered a maximum annual growth of 8 percent and above excepted Cameroon. Ivory Coast registered a negative growth in 2011 due to a political crisis. Suppressing that just after the crisis the growth was 10 percent in Ivory Coast, better than Cameroon which is relatively in peace. However Nigeria, the most populous country of Africa has the highest annual per capita growth. But the nominal growth calculated here doesn't take the inflation to the consideration, which can be the source of growth. Nevertheless the growth measures only the economic performance of a whole country and does not give any information about the individual or collective well-being. The Human Development Index (HDI) is an index that measures countries' achievements in *longevity*, *education, and income* which seems preferable than the average growth. The results show that the HDI is low for all selected African countries. The World Bank classified Ecuador as an Upper middle income country. Adult literacy, HDI and life expectancy differentiated Ecuador from others selected developing countries.

4. Methodological challenges and sample description

The goal of the present chapter is to explain the methodological approach used to evaluate the impact of microcredit on household income. The household agricultural model was theoretically developed in chapter two. This chapter aims to match the theoretical model with the empirical application. The chapter is organized as follows: First we present the overview of the evaluation problem and provide some methodological background information. Next, the approach chosen is presented and discussed. The chapter concludes with a review of the data.

4.1. Overview of impact evaluation challenge

The fundamental issue to evaluate the impact of a program on an outcome is to find a good counterfactual. In the case at hand, we would like to evaluate the impact of microcredit on household income. The counterfactual indicates what would have happened to the beneficiaries of microcredit (the so-called treatment group) if the microcredit program had not existed. Subsequently, it is not sufficient to observe the impact on those who received the credit. We have to think about what might have happened to them in the absence of the microcredit program (the counterfactual issue). Thus, there is a missing data problem. In the case at hand, we will construct a comparison group (the control group) and compare the outcomes of the comparison group and treatment group. Both groups must be similar in their characteristics so that those who received the treatment (credit) would have had incomes similar to those in comparison group in absence of treatment (Khandker, Koolwal, & Samad, 2010, p. 25). Those who received the credit are referred to as the treatment group, participants or borrowers and those who have not yet received the credit are referred to as the control group, non-participants or non-borrowers.

4.2. Methodological framework for constructing the counterfactual[35]

In this section, different methods of impact evaluation are outlined and the one chosen in this research is discussed in detail. Each method provides an approach to construct the missing counterfactual. To measure the impact of microcredit on household income, let us use the equation (4.1), which presents the basic evaluation problem, adapted from (Khandker, Koolwal, & Samad, 2010, p. 25), where Y represents the household income that depends on a set of observed characteristics (covariates) X and a membership dummy variable M equal to 1 if an individual i is a participant and 0 otherwise. and ε, the error term representing unobserved characteristics that affect Y.

$$Y_i = \alpha X_i + \beta M_i + \varepsilon_i \quad (4.1)$$

Except in the case of experimental data, the assignment to the treatment (in our case a microcredit program) is often nonrandom. Why do some households decide to borrow and others decide not to? If only the more entrepreneurial households borrow, then unmeasured "entrepreneurship" may influence the outcome. Why a microfinance institution is located in the village A and not in the village B? Some villages are viewed as more entrepreneurial or have dynamic leaders or simply poorer. So the assignment to the treatment is often nonrandom because of:

(a) the purpose of the program placement. (Coleman, 1999) calls it "endogenous program placement". That is microcredit programs are placed according to the communities and individuals interest.

(b) self-selection into the program. An individual's participation decision is probably based on personal characteristics. Self-selection can be based on observed characteristics (land, income, etc.), unobserved characteristics (entrepreneurial ability) or both.

Neglecting the issues self-selection and program placement will lead us to biased estimates of impact (Blundell & Dias, 2000, p. 431), (Khandker, Koolwal, & Samad, 2010, p. 25) and (Coleman, 1999, p. 112). The main methods for evaluating impact are as follows. Each method has its own approach to handle the issues of bias (Ravallion, 2001, p. 137):

- Randomized evaluations or experiments
- Propensity score matching methods (PSM)

[35] The methodology is strongly inspired by the work of (Khandker, Koolwal, & Samad, 2010)

- Difference-in-difference methods (DID)
- Instrumental variable methods (IV)

(1) *Randomized evaluations or experiments* assume that microcredit programs are placed at random in the areas, independent on the need of the communities and individuals and each individual has the same probability to receive the credit. Therefore the bias cancels out. The treatment and the control groups have the same expected outcome in the absence of microcredit programs.

(2) *Propensity score matching (PSM)* deals with the issues of bias by constructing the control group using the observed characteristics X based on the propensity score, which is the probability of receiving the credit. Then it compares the average outcome of both groups after matching.

(3) *Difference-in-difference methods (DID)* are used when at least two period datasets are available. They allow for unobserved characteristics assuming they are time invariant. By comparing the outcome of the two groups at different points in time, the bias cancels out through differencing.

(4) *Instrumental variable methods (IV)* allow to account for biases (endogeneity) that arise from non-random participation of households (self-selection) and non-random microcredit program placement. The self-selection could be based on observed or unobserved characteristics or both. If assignment to the treatment is non-random, unobserved characteristics will be correlated with the membership dummy M_i. That is $Cov(M_i, \varepsilon_i) \neq 0$, which implies violation of the key assumptions of ordinary least squares (OLS) in obtaining an unbiased estimate: independence of regressors from the error term. The IV solves the problem by finding instruments Z, which are highly correlated with the program placement or participation but not correlated with unobserved characteristics affecting the outcomes (Khandker, Koolwal, & Samad, 2010, p. 87). The problem remaining is to find the good instruments (Armendáziz de Aghion & Morduch, 2005, p. 213).

There is no perfect method. Each method has a drawback. For instance, there may be some unobserved factors influencing individuals to receive the credit and microcredit programs might be placed according to the need of the communities. Therefore randomized evaluation cannot be used. It assumes that assignment to the treatment is at random. The IV can solve the bias issues, but it is difficult to find strong instruments. The PSM will construct a control group (counterfactual) that is as similar as possible to

the treatment group based only on the observed factors. Its drawback is that, only observed characteristics are sources of the bias and the DID allows only for unobserved factors that do not vary over time. To solve the bias issue from both factors (observed and unobserved factors), we will combine both methods: PSM and DID. The PSM will eliminate the biases arising from observed characteristics and DID, those coming from unobserved characteristics using the results of PSM (Bosch & Zeller, 2013, p. 121) and (Caliendo & Kopeinig, 2008, p. 55). The DID matching can only be used if the Hausman test (fixed effect versus random effect) goes for fixed effects. That is unobserved characteristics are fixed over time (see Section 5.3 for more details). If the unobserved factors vary over time, than the IV methods are used. With panel data being available, the application of IV methods allows for a time varying selection bias.

4.2.1. Propensity score matching method (PSM)

The PSM method was first suggested by (Rosenbaum & Rubin, 1983). Its basic idea is to select among the control group those who are similar to the participants based on the propensity score using the observed characteristics and compare their average outcomes (Caliendo & Kopeinig, 2008, p. 32).The propensity score is the probability to receive the treatment (microcredit) which varies from zero to one. PSM depends on two conditions (Khandker, Koolwal, & Samad, 2010, p. 53): (1) conditional independence (that is, the unobserved characteristics do not influence the assignment to the treatment. For example, unobserved factors do not affect individuals to receive a credit), and (2) the size of common support on propensity score between both groups that is finding among a large control group those who have a similar score with the treatment group. Therefore individuals from the control group who are outside the common support are dropped because no match is found.

The propensity score is used to match the treatment and control groups in order to estimate the difference in outcome, also known as the Average Treatment on the Treated (ATT) (Caliendo & Kopeinig, 2008, p. 34) and (Katchova, 2008, p. 5). It is given by

$$Y = \begin{cases} Y_1, & M = 1 \\ Y_0, & M = 0 \end{cases} \qquad (4.2)$$

Where the treatment $M = 1$ for the treatment group and $M = 0$ for the control group.

Y_1 = income for those who received the credit and Y_0 = income for the control group.

$$ATT = (Y_1 - Y_0|M = 1) = E(Y_1|M = 1) - E(Y_0|M = 1) \quad (4.3)$$

Different matching methods have been used (Becker & Ichino, 2002, pp. 361 -364):

- *The nearest-neighbor matching (NNM):* consists of matching each treatment individual with the control individual that has the closest propensity score.
- *Radius matching (RM):* is a form of nearest neighbor matching that tries to avoid bad matches (bad matches are those for which the propensity score for non-participants is far from the propensity score for participants) by imposing a tolerance on the maximum propensity score distance (Smith & Todd, 2005, p. 315).
- *Stratification or interval matching*: the common support of the propensity score is partitioned into different intervals and the impact of microcredit programs is calculated within each interval (Smith & Todd, 2005, p. 316) and (Khandker, Koolwal, & Samad, 2010, p. 60).
- *Kernel and local linear matching*: each participant is matched with a weighted average of all non-participants with weights that are inversely proportional to the distance between the propensity scores of both groups (Katchova, 2008, p. 6).

For PSM to work, the balancing property must be satisfied. That is the treatment and control groups must be balanced in the similar propensity score, based on similar observed characteristics (Khandker, Koolwal, & Samad, 2010, p. 59). The PSM method selects among the control group those who are similar and those who are very closed to the treatment and therefore can reduce the sample size depending on the method used. Furthermore it assumes that the assignment to the treatment is only due to observed characteristics. That is only observed characteristics can influence individuals to receive the treatment (microcredit) and which is not always the case. Both observed and unobserved characteristics can have an impact of borrowing.

4.2.2. Difference-in-difference matching method (DID)[36]

The DID is only applied when at least one pre-program set and one post-program set of observations are available (Blundell & Dias, 2000, p. 442). It reveals stronger evidence on changes in household income of the treatment and control groups at different

[36] The research was conducted in 2003, 2005 and 2012/13 and the per capita household income was calculated for the years 2002, 2004 and 2011.

points in time after (a) and before (b) the treatment[37] using the result of PSM (Heckman, Ichimura, Smith, & Todd, 1998, p. 1029). That is calculating the average household income for both groups before and after the microcredit program intervention in order to see the real change in income. However, it is rather rare that studies with longitudinal data have pre-program data (Khandker, 2005), (Alexander, 2001), (Berhane & Gardebroek, 2010), (Imai & Azam, 2012), (Chowdhury & Chowdhury, 2011), (Bosch & Zeller, 2013), etc. In the case at hand, we do not have the average income before the treatment group entered the program, neither the data of the control group. Therefore the average income in 2002 (the baseline data) is referred to as" before" and the average income in 2011 as "after" the microcredit program. DID methods allow for unobserved heterogeneity (unobserved characteristics) and assumes that they are time invariant, so the issues of self-selection bias and program placement cancel out through differencing. To understand the biases arising from program placement and self-selection, we consider the following equations (adapted from (Coleman, 1999, p. 114)):

$$Y_{ijt} = \alpha X_{ijt} + \beta V_j + \gamma M_{ij} + \delta T_{ijt} + \varepsilon_{ijt} \qquad (4.4)$$

Were Y_{ijt} is the income for an individual i *in a* village j at the time t; X_{ijt} is a vector of household characteristics; V_j is a vector of unobserved village characteristics; M_{ij} is a dummy treatment equal to 1 if the individual i in a village j has received the credit and 0 otherwise. M_{ij} can be thought of as a proxy for the unobservable characteristics that lead households to self-select into the microfinance MC[2]- that is, it captures unobserved factors that caused ε_{ijt}. T_{ijt} is the number of times an individual has borrowed; α, β, γ, δ are parameters to be estimated and δ is the coefficient that explains the impact of microcredit.

The difference-in-difference average treatment effect on the treated is adapted from: (Armendáziz de Aghion & Morduch, 2005, p. 211):

$$Y_{ijta} - Y_{ijtb} = ATT = E(\Delta_a - \Delta_b \,|M = 1)$$

$$= E((Y_{1a} - Y_{0a}) - Y(_{1b} - Y_{0b})|\mathrm{X}, \mathrm{M} = 1)$$

$$= \alpha X_{ijta} + \beta V_j + \gamma M_{ij} + \delta T_{ijta} + \varepsilon_{ijta} - \alpha X_{ijtb} - \beta V_j - \gamma M_{ij} - \delta T_{ijtb} - \varepsilon_{ijtb}$$

[37] (a) and (b) respectively refer to after and before the treatment.

$$= \Delta Y_{ij} = \Delta X_{ij}\alpha + \Delta T_{ij}\delta + \Delta\varepsilon_{ij} \quad (4.5)$$

Y_{1a} and Y_{1b} are respectively the average income for the treatment group after and before the program intervention. Y_{oa} and Y_{0b} are respectively the average income for the control group after and before the program intervention. Y_{ijta} and Y_{ijtb} represent respectively the income for an individual i in a village j at the time t after (in 2011) and before (in 2002) the microfinance program intervention.

The self-selection bias based on unobserved factors and the village unobserved factors cancel out through the difference. The PSM eliminates the bias due to the observed factors and the DID matching, the remaining one due to unobserved factors (Caliendo & Kopeinig, 2008, p. 55). The Hausman test will tell us whether the unobserved factors are fixed over time or not.

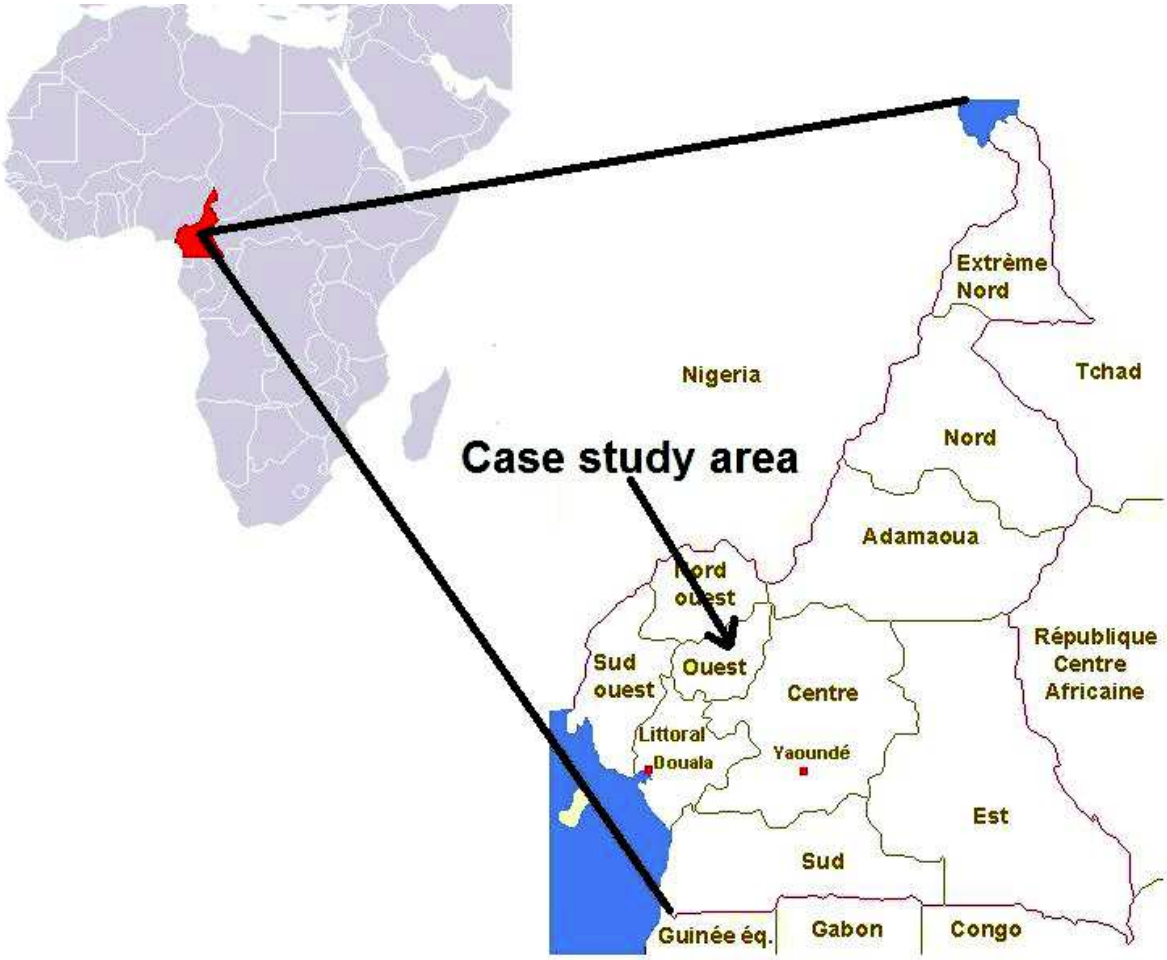
4.3.Longitudinal data description

In this section, the data issues and variables used in the model are outlined. We collected data in 2012/13 to supplement a longitudinal database consisting of two survey rounds from 2003 and 2005 in the Western Province[38] of Cameroon (the following figure presents the case study area in Cameroon). The first *Mutuelles Communautaires de Croissance* (MC^2), the local intermediaries of the microfinance program[39] evaluated in this study started in this province and it also has the largest number of MC^2 and hence it met the study's research objectives (Djeudja, 2006, p. 79). Quantitative data were collected via household surveys with an identical standardized questionnaire, carried out for all three periods.

[38] For a comprehensive description of the study area, please refers to (Djeudja, 2006, p. 82).

[39] Microfinance opted for our study.

Figure 4.1: **Case study area in Cameroun**



Source: adapted from http://www.statistiques-mondiales.com/cameroun.htm

4.3.1. First and second period of the survey: 2003 and 2005

Among the existing MC^2 in Western Cameroon, Djeudja (2006) selected the 10 oldest ones. These MC^2 chosen were previously located in villages, but today among them, some have become arrondissements and others, departments. Once the choice of MC^2 was made, he opted for households[40] who obtained their first credit at least 4 years before the first period of survey (2003) and such households who were already members of the microfinance MC^2 but who had never received credit. Those who received the credit are referred to as the treatment group and those who had not yet received it are referred to as the control group. For more details on the methodological approach in

[40] A household is a member of the microfinance MC^2 who belongs to our sample.

defining these two groups, please refer to section 4.1 above. The two groups present similar characteristics in the following areas:

- having her/his residence in the same geographical location;
- having her/his activity in the same geographical location;
- exercising the same sector of activity;
- being a member/client of the microfinance MC^2.

Using simple random sampling, Djeudja (2006) interviewed a total of 235 households in 2003. In 2005, his sample consisted of 198 households (dropout rate of 15.74 percent). Reasons given to justify the dropout are presented in the next section. However, the empirical research was financially supported by the NGO Misereor in Germany. This of cause limited the sample size; obviously the sample cannot be considered representative in a pure statistical sense.

4.3.2. The third period of the survey: 2012/2013

The third period of survey began in September 2012 and was completed at the end of January 2013. The first challenge was to find again the households interviewed in 2003 and 2005. In the same effort, we constructed a parallel sample for qualitative analysis. The qualitative sample consisted of married women as this study also aims at explaining how access to microcredit contributes to women's empowerment[41]. We started on 10th of September 2012 by visiting the 10 MC^2 selected by Djeudja with the aim to:

- establish the list of households interviewed in 2003 and 2005;
- find the agricultural extension workers who interviewed the households in 2003 and 2005 ;
- and establish a list of married women who have received at least one credit. The objective was to evaluate the impact of access to microcredit on women's empowerment.

With the help of the staff of the MC^2 and the agricultural extension workers, we identified 73 households of the original 198 households interviewed in 2005. We also added 179 households to have a total sample of 252. After establishing the list of

[41] See chapter 6 for more details on the impact of microcredit on women's empowerment.

interviewees, we started training agricultural extension workers in mastering the questionnaire before beginning the survey[42] (see Table 4.1 for more details on the interviewed households and the MC^2). The survey itself began in mid-October 2012 and ended in late January 2013. This research was conducted in 2003, 2005 by Djeudja and 2012/13 by the author and my contribution is to observe the changes in household income after nine years. However, the research was financially supported by the NGOs EED Church Development Service (EED) and Brot für die Welt.

Table 4.1: Number of households interviewed in 2003, 2005 and 2012

Location of MC^2	Number of households interviewed in 2003	Number of households interviewed in 2005	Number of households interviewed in 2012/13		
			Remaining sample from 2003 and 2005	New sample	Total
Penka-Michel	29	26	01	27	28
Doumbouo	27	23	08	12	20
Bayangam	12	07	00	12	12
Bagou	10	08	00	17	17
Bandjoun	27	24	18	34	52
Bandja	43	38	09	31	40
Bamendjou	30	27	02	18	20
Baham	18	16	09	18	27
Bafou	10	07	03	08	11
Babouantou	29	27	23	02	25
Total	**235**	**198**	**73**	**179**	**252**

Source: Own data

Already the dropout rate in 2005 was substantial with 15.74 percent. Obviously the lengthy interval between 2005 and 2012 brought about an even higher dropout rate, with 63.13 percent. The dropouts are comprised of those:

- from the control group who received a credit in the meantime;

[42] The interview was made by the author and the agricultural extension works.

- who left the village;
- who were absent during the interview period;
- who passed away;
- who refused to be interviewed again;
- who were no longer interested in participating in the MC[2].

4.3.3. Variables used in the empirical model

We want to evaluate the impact of microcredit on household income. So the outcome variable is the annual household income per capita[43], which is computed as the total sum of income from farm and non-farm activities, and so called unearned income (e.g. social transfers, dowry payments, remittances etc.) divided by the number of individuals within a household[44]. Variables used for our model described in equation (4.4) are shown in Table 4.2 below.

[43] The main contributions of the past decade with regard to analyzing the impact of microcredit on welfare used either the household income/consumption or per capita income/consumption, e.g. (Pitt & Khandker, 1998), (Khandker, 2005), (Kiiru, 2007), (Roodman & Morduch, 2009), (Berhane & Gardebroek, 2010), (Imai & Azam, 2012). We opted for the household income per capita in order to have the income for every single member of the household.

[44] The inflation was measured by the consumer price index from 2003 to 2011: http:// data.worldbank.org/indicator/FP.CPI.TOTL.ZG

Table 4.2: Variables used in the empirical model

Variable name	Variable definition
Dependent variable	
Treatment	1 if a household has received at least once a microcredit, 0 otherwise
Outcome variable	
HH income	Annual household (HH) per capita income
Independent variables	
Age of HH head	Age of the individual in the household, who is the member in the MC^2.
Gender	1 if household member is male, 0 otherwise
Ratio	Dependency ratio = HH members who are too young or too old to work divided by HH members who have an activity.
Education	Education level of household member of MC^2
Empruntex	1 if a HH has the possibility to borrow outside MC^2, 0 otherwise
Revhors	1 if a HH has access to unearned income, 0 otherwise
Distance	The distance from home to the microfinance MC^2 (meter)
Credit	Number of times a household has borrowed

Source: Own data

Note: HH = household

We did not interview all members of the household, but only the head of the household who is generally the member of the microfinance intermediary in question, which is the MC^2.

Education: 0; 1; 2 and 3 were given to those who did not attend the school, those who attended the primary, secondary school and university, respectively.

Age = 1; 2; 3 were given respectively to those who were less than 30; 31 to 50; and 51 and above.

The first intuition with regard to an impact evaluation of microcredit on household income would be to use the amount of credit received as an impact proxy. Using the amount of credit received as proxy reveals, however, shortcomings. The shortcomings arise because the credit is constrained (Diagne & Zeller, 2001, p. 62). This study uses the coefficient of number of times borrowed as an estimator for impact. This estimator has been chosen mainly because, unlike the amount borrowed, it is rather exogenously determined to the household. This is because it depends first on how long the microcredit program has been available to the household, second on the evaluation through the microcredit program officers, whether or not to grant another microcredit, and, third when the microcredit program works with joint liability groups, on the group peers who determine how many times they would allow one member to borrow (Kiiru, 2007, p. 103).

4.3.4. Shortcoming/weakness of this sample

The goal of this research from the beginning was to follow the households interviewed in 2003 and 2005 and observe the changes in income over time. Longitudinal datasets for microcredit impact evaluation in an African context are rather rare and thus, the challenge to add a third survey round to an existing data set was accepted. But once a household from the control group got a microcredit, he had to be eliminated from the sample. This is one of the main reasons, apart from those mentioned in Section 4.3.2 for the sharp drop in the 2012 sample with 73 households remaining (balanced panel data): that is 12 households in the control group and 61 in the treatment group. The weakness of this research might be the sample size.

The following section discusses the concept of data quality.

4.3.5. Data quality[45]

Quality is not an easily defined concept. According to (Brackstone, 1999), (Statistics Canada, 2002, p. 3), (Federal Committee on Statistical Methogology, 2001) and (Eurostat, 2007), the key concepts below are important for the understanding of quality:

- *Relevance:* it refers to the degree to which the data meet the real needs of users. It is concerned with whether all data that are needed are produced and the extent to which concepts (definitions, classifications etc.) reflect user needs.
- *Accuracy* is the degree to which the data correctly describes the phenomena it was designed to measure. The sampling and non-sampling errors (the sources of error) affect the accuracy of the results.
- *Timeliness*: accurate information on relevant topics will be useful if they arrive timely for use in the decision-making. It reflects the length of time between its availability and the phenomenon it describes.
- *Accessibility* refers to the ease with which the data can be obtained.
- *Coherence* reflects the degree to which the data can be successfully brought together with other data within a broad analytic framework and over time.
- *Comparability* indicates the capability to make reliable comparisons over time.

In the following, we will address those concepts with regard to the data used in this study:

[45] This section has benefited from Brackstone (1999), Statistics Canada (2002) and Eurostat (2007).

Relevance: while the data suffers from a noticeable rate of dropouts over time, the data were collected for the sole purpose of applying an impact analysis, thus the data is relevant with regard to the objective of the study.

Accuracy: refers to the question: are the data correct? The accuracy denotes the closeness between estimated values and the true (unknown) values. In the next subsection, measures undertaken to maintain the highest degree of data accuracy are described.

Timeliness: the issue whether or not access to microcredit is improving the livelihoods of those receiving the microcredit is still academically debated as pointed out earlier. Therefore, scientific contributions in this regard can still be considered timely, especially when based on longitudinal data.

Accessibility: the data will be available at Martin-Luther-University Halle-Wittenberg, Institute of Agricultural and Nutrition Sciences, Halle (Saale) and made accessible on demand by the author of this work.

The sources of errors affecting the accuracy of data can be grouped into two categories: the sampling and non-sampling errors

(1) *Sampling errors:* "arise from estimating a population characteristic by looking at only one portion of the population rather than the entire population. It refers to the difference between the estimate derived from a sample survey and the 'true' value that would result if a census of the whole population were taken under the same conditions" (Statistics Canada, 2013).[46]
(2) *Non-sampling error:* these are errors that occur throughout the survey process.

The sources of non-sampling error are: coverage error, measurement error, non-response error, and processing error.

- *Coverage error*: during a census, we are confronted with counting errors. This may be due to omissions, duplications or wrong inclusion in the sample.
- *Measurement error:* are due to poor designed questionnaire, the interviewee, the interviewer, etc. Poor wording of a question is confusing and can lead to the wrong answer. Also a reformulation of a question can have an impact on respondent's

[46] http://www.statcan.gc.ca/edu/power-pouvoir/ch6/sampling-echantillonage/5214807-eng.htm (accessed 23.05.2014).

answer. The respondent can intentionally or unintentionally provide wrong responses to the question.

- *Non-response error:* it is difficult to obtain sufficient answers to all questions. The respondent can either completely refuses the interview for some raisons or decides to partially answer some questions. Partial answers are either due to sensitive questions or the ability of understanding the questions.
- *Processing error:* occurs after the survey data are collected, during the preparation of the final data. It is mainly due to codification, computer programs, data entry error, etc.

As this issue is particularly relevant in datasets, more so in longitudinal datasets, the measures undertaken to minimize sampling and non-sampling errors are presented in the next section.

4.3.6. Measures undertaken to maintain the highest degree of data accuracy

We want to have data free of errors. The survey quality can be measured by the Mean Squared Error (MSE), which is the sum of the variance and the squared bias. One of its weaknesses is that most survey error assessments are incomplete in the sense that it is not possible to include the effects of all error sources (Lyberg, 2012, p. 107).

In the case at hand, we couldn't avoid the sampling errors because we could not interview all clients of the MC^2. However, each individual was identified by her/his name, the area of the MC^2 (village) to avoid interviewing an individual more than one time. The sample was not so large; therefore errors due to omission were minimized. Individuals, who were wrongly included to the sample, were excluded while entering data in the computer. This is how coverage errors were reduced.

To minimize measurement error, we designed the questionnaire as simple as possible so that the interviewer could easily understand and translate it. Interviewers were selected among agricultural extension worker who lived close by those villages where the respective MC^2 was located. All interviewers spoke the local language. On average, the selected extension workers already knew around 80 percent of the respondents from their work. Thus, the interviewer could easily validate the information given by the respondents.

Non-response error: the interviewers ensured that the respondents felt comfortable and could discretely respond to the sensitive questions. Anonymity was guaranteed.

Processing error: the data was entered in by the researcher herself using SPSS. We double checked the longitudinal data focusing mainly on the calculation of household income, which is our outcome variable.

5. Microcredit and household income: Empirical results

The aim of this chapter is to present the results of the empirical investigation of microcredit on household income. Access to microcredit is hypothesized to increase the household per capita income. The chapter is structured as follows: we start describing the control and the treatment groups based on theirs socio-economic characteristics, then we match both groups using different methods (PSM) in order to be insured both groups are similar before we compare their average incomes. Then, we control for the changes in income for both groups over time using the panel data.

5.1. Overview of socio-economic characteristics of the households[47]

We mentioned in Section 4.1 that the challenge to evaluate the impact of microcredit programs on a certain outcome is to identify a counterfactual. The counterfactual indicates what would have happened to the beneficiaries of microcredit (treatment group) if the program had not existed. The counterfactual (the so-called control group) was constructed based on observed characteristics, and to be compared with the treatment group (those who received the microcredit).The table below compares both groups for the year 2002 (baseline year) based on their socio-economic characteristics. The data is analyzed using the independent t-test for the continuous variables and Chi-square test for categorical variables. In 2002 those who received the microcredit have 44730 CFA francs (about US-$72)[48] more than those who did not (control group). This difference may be due to the variations in the household socio-economic characteristics. We mentioned in Section 4.2 that microcredit programs are often placed according to the communities and individual's needs, in turn self-select into the program. The self-selection may be based on their observed socio-economic und unobserved characteristics and if the self-selection and program placement issues are neglected, the results will be biased. The PSM controls

[47] The research was conducted in 2003, 2005 and 2012/13 and the per capita household income was calculated for the years 2002, 2004 and 2011.

[48] 1 USD ≅ 621 XAF (XAF is the currency code for Francs): http://www.xe.com/en/currency/xaf-central-african-cfa-franc-beac accessed 11th March 2015

the bias based on observed characteristics and the panel data sets will reveal the bias issue based on unobserved characteristics. The finding in Table 5.1 indicates that there is a significant difference between the two groups. This difference lies in dependency ratio and the distance from home to MC[2]. Therefore the real impact of microcredit on household income in 2002 cannot be concluded as longer as both groups are not similar. The PSM needs to be implemented to calculate the real microcredit program's effect.

Table 5.1: Household socio-economic characteristics, 2002

Socio-economic characteristics of households	Mean T n = 139	Mean C n=59	Mean total sample n =198	Mean difference T-C	P- value
Income per capita CFA franc	99 221	54 490	85 892	44 730	0.130
Gender	0.820	0.729	0.793	0.090	0.147
Age	2.353	2.356	2.353	-0.003	0.971
Education	1.438	1.372	1.419	-0.065	0.553
Ratio	3.156	2.627	3.287	0.529**	0.028
Empruntex	0.266	0.373	0.298	-0.107	0.135
Revhors	0.446	0.525	0.469	- 0.079	0.308
Distance	3737	2255	3295	1482**	0.005
Credit2002	2.320	0	1.631	2. 320***	0.000

Source: own data

Notes: The signs *, **, *** represent significance levels at 10, 5 and 1 percent level, respectively

T represents the treatment group and C the control group

Education = 0; 1; 2 and 3 were given to those who did not attend the school, those who attended the primary, secondary school and university, respectively.

Age = 1; 2 and 3 if the interviewed household head is respectively below 30; between 31 and 50; and above 50 years old.

5.2. Application of the PSM method[49]

The aim of matching is to ensure that the control group is very similar to the treatment group before we compare their income. To calculate the program treatment effect, the propensity score (the probability to receive a microcredit) must first be calculated using Probit or Logit model. Probit or Logit model is calculated based on observed socio-economic characteristics (covariates). Both models yield similar results (Caliendo & Kopeinig, 2008, p. 37). In our model, the variable "credit2002" (the number of times a household has received the credit before the year 2003) is excluded because it is equal to zero for the control group.

Table 5.2: Propensity score model (Probit model)

Dependent variable is whether or not a household has received microcredit(treatment)								
Treatment	Gender	Age	Education	Ratio	Empruntex	Revhors	Distance	cons
Coefficient	0.310	-0.240	-0.103	0.088	-0.160	-0.070	0.001	0.544
p-value	0.200	0.210	0.514	0.036	0.600	0.810	0.007	0.325
Model characteristics	Pseudo R^2 = 0.075 Log likelihood = - 111.59 No. of observations = 198							

Source: Own data, STATA: psmatch2

Note: The description of the variables can be found in Table 5.1.

Table 5.2 shows that those who have high dependency ratio are more likely to request for the credit. In one hand, the household size is considered in Cameroon as the wealth. Traditionally a man is recognized by the number of his children, particularly in village. On the other hand, the household size may be a big issue. The more the size of the family gets bigger, the more the financially needs increase especially when children start going to school. When the number of household members who have an activity (that generates the income) is larger than the number of household members who are too young or too old to work (dependents), obviously the need for credit becomes important. The finding also revealed that those who live far away from MC^2 are more likely to request

[49] We refer to (Leuven & Sianesi, 2003) , (Becker & Ichino, 2002, p. 365) and (Villa, 2011) for the implementation of the PSM and DID methods.

for the credit. In some areas where access to MFIs is difficult, agents of MFIs move throughout the village to collect money from peasants. But if such collect-services do not exist, the distance can negatively impact individuals' decision to participate to MFIs. In the case of our study, 8 out of 10 MC[2] are located in the marketplace. Therefore peasants sell the agricultural commodities the market days and use the opportunity to do the financial transaction. Consequently the distance should not be a problem. However, the explanatory power of the model is low: only 7.5 percent of the total variation in the dependent variable is due to the explanatory variable. However the objective here is not to look at the probability to receive a treatment, but to insure that both groups are similar. Using the PSM, household characteristics unmatched and matched are presented in Table 5.3.

Table 5.3: Household characteristics after matching 2002

Variable	Unmatched Matched	Mean		% bias	% reduction |bias|	p-value
		Treatment	Control			
Gender	Unmatched	0.820	0.729	21.8	-	0.148
	Matched	0.803	0.819	3.8	82.8	0.750
Age	Unmatched	2.353	2.356	0.6	-	0.971
	Matched	2.331	2.331	0.0	100	1.000
Education	Unmatched	1.4388	1.372	9.2	-	0.553
	Matched	1.433	1.409	3.3	64.2	0.774
Ratio	Unmatched	3.568	2.627	36.5	-	0.028
	Matched	3.158	3.213	2.1	94.1	0.857
Empruntex	Unmatched	0.266	0.373	22.9	-	0.135
	Matched	0.276	0.181	20.3	11.4	0.073
Revhors	Unmatched	0.446	0.525	15.8	-	0.308
	Matched	0.448	0.386	12.6	20.6	0.311
Distance	Unmatched	3737	2255	48.8	-	0.005
	Matched	3043	2847	6.5	86.8	0.532

Source: Own data, STATA: pstest

The STATA command "pstest" is used to check the success of matching. The Table 5.3 indicated that after matching, there are no longer systematic differences in the distribution of covariates (household characteristics) between the treatment and control groups. Once household characteristics are similar, the average treatment effect of

microcredit is calculated in the following table using the nearest neighbor, radius and kernel matching.

Table 5.4: Income per capita, 2002- Average treatment effect on the treated (ATT)

Income per capita CFA franc (n=198)	Treatment	Control	Difference	t-test
Unmatched	99 221	54 490	44 730	1.51
ATT nearest neighbor matching	103 155	58 090	45 064*	1.82
ATT Radius matching	103 155	54 490	48 664**	2.34
ATT Kernel matching	103 155	56 696	46 458 *	1.96

Source: Own data, STATA: psmatch2
Notes: The signs *, **, *** represent significance levels at 10, 5 and 1 percent level, respectively.

Before matching, the results of Table 5.1 revealed a positive, no significant impact of microcredit on household income. After matching, both groups are similar and we found a positive significant impact of microcredit in 2002. Conclusion, microcredit has a positive significant impact on household income in 2002.

The drawback of PSM is its assumption that the assignment to the treatment is only based observed characteristics. Obviously, this is not always the case. Both observed and unobserved characteristics can have an impact of borrowing (Khandker, Koolwal, & Samad, 2010, p. 53). The PSM can reduce the sample size dependent on the method used (the nearest neighbor, radius and kernel matching method). However, the panel data will control for unobserved characteristics (e.g. entrepreneurial ability).

5.3.Panel data (2002, 2004, 2011)[50]

The Panel data allows us to follow the households interviewed in 2003 and 2005 and observe the changes in income over time. We have a balanced panel data (the same individuals interviewed in three periods). Both groups were already similar in 2002 based to the household characteristics (after matching). The likelihood that these household characteristics change over time exists. Therefore we still need to control for these

[50] We wish to state once again that the research was conducted in 2003, 2005 and 2012/13 and the per capita household income was calculated for the years 2002, 2004 and 2011.

covariates in 2004 and 2011. Let us first observe the changes in household income in 2004 and 2011.

Table 5.5: Average income per capita 2002, 2004 and 2011

	Average income per capita in franc CFA		
	2002 (n=198)	2004(n=198)	2011(n=73)
Treatment	103 155	157 820	297 035
Control	58 090	103 530	434 441
Difference	45 064	54 290	-137 405
p-value	0.075*	0.045**	0.220

Source: Own data

Notes: The signs *, **, *** represent significance levels at 10, 5 and 1 percent level, respectively.
The average income in 2002 in this table is calculated using the nearest neighbor matching (using the three methods, all results are positive and significant see Table 5.4).
1 USD ≈ 621 XAF (XAF is the currency code for Francs): http://www.xe.com/en/currency/xaf-central-african-cfa-franc-beac accessed 11th March 2015
The annual inflation was measured by the consumer price index: http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?page=1

The results of Table 5.5 indicated that the average income has increased for both periods 2004 and 2011. Microcredit has a positive significant impact in 2002 and 2004 confirming the findings of Djeudja (2006). But in 2011, it has no impact (the control group is better off than the treatment group).

The difference in income between treatment and control group in 2004 may be due the variation in household characteristics. Between 2002 and 2004, although the panel is balanced, there may be some changes in household characteristics over time. Let check the household socio-characteristics in 2004 and see if there are still similar before we conclude.

Table 5.6: Household socio-economic characteristics, 2004

Socio-economic characteristics of households	Mean T n = 139	Mean C n=59	Mean total sample n =198	Mean difference T-C	P- value
Income per capita CFA franc	157 820	103 530	14 1 643	54 290**	0.045
Gender	0.820	0.729	0.793	0.090	0.147
Age	2.355	2.359	2.353	-0.003	0.971
Education	1.446	1.355	1.419	0.090	0.412
Ratio	2.935	2.559	3.823	0.375	0.15
Empruntex	0.561	0.559	0.560	0.002	0.981
Revhors	0.827	0.779	0.813	0.048	0.431
Distance	3747	2255	3285	1492**	0.005
Credit2004	0.618	0	1.434	0. 618***	0.000

Source: Own data

Table 5.6 reveals that those who received microcredit have 54 290 CFA francs (about US-$87) more than those who did not (control group). Both groups are relatively similar but there is still a huge gap between the distances. The variable distance from home to MC^2 is similar in 2002 and 2004. It is likely that from 2002 to 2004 the interviewees did not move to other neighborhoods or the microfinance intermediary MC^2 did not change its location. Since difference lies in the distance from home to MC^2, the PSM method is implemented to insure that the two groups are almost identical before we conclude.

Table 5.7: Household characteristics after matching 2004

Variable	Unmatched Matched	Mean		% bias	% reduction |bias|	p-value
		Treatment	Control			
Gender	Unmatched	0.787	0.728	13.7	-	0.444
	Matched	0.775	0.775	0.0	100	1.000
Age	Unmatched	2.500	2.355	24.7	-	0.971
	Matched	2.465	2.293	29.5	19.7	0.113
Education	Unmatched	1.360	1.355	1.1	-	0.171
	Matched	1.361	1.355	1.1	-	0.171
Ratio	Unmatched	2.742	2.559	11.3	-	0.531
	Matched	2.793	2.500	18.2	60.1	0.339
Empruntex	Unmatched	0.545	0.559	-2.8	-	0.878
	Matched	0.568	0.517	10.3	273	0.580
Revhors	Unmatched	0.833	0.779	13.5	-	0.451
	Matched	0.832	0.779	13,4	-	0.452
Distance	Unmatched	4116	2255	63.9	-	0.001
	Matched	3201	3367	-5.7	91.1	0.718

Source: Own data, STATA, pstest

Table 5.7 indicated that after matching, there are no longer systematic differences in the distribution of covariates (household characteristics) between the treatment and control groups. The distance from home to MC^2 for the two groups is almost identical. The average treatment effect of microcredit on household income in 2004 is calculated in the following table using the radius matching method. The sample size has reduced a lot using the nearest neighbor and kernel matching. The PSM method generally reduces the sample size and therefore can eliminate the individuals with high or less income and thus influence the results. For this reason we prefer the method with the highest sample size remaining after matching.

Table 5.8: Income per capita, 2004- Average treatment effect on the treated (ATT)

Income per capita CFA franc (n=125)	Treatment	control	Difference	t-test
Unmatched	147 813	103 530	44 283*	1.66
ATT Radius matching	148 898	103 530	45 368*	1.77

Source: Own data, STATA, psmatch2

Notes: The signs *, **, *** represent significance levels at 10, 5 and 1 percent level, respectively.

The Table 5.8 revealed that after matching, we can affirm that microcredit has a positive significant impact on household income in 2004. But in 2011, microcredit has no impact. By the contrast, the control group is better off that the treatment group. Although the result is not significant, what really went wrong? Does the sample size matter? Who are the dropouts? Do unobserved factors influence the results? Could the reason be at the microfinance MC^2 level? What was the credit used for? These questions are answered in the following section.

Does the sample size matter?

The size of the sample was drastically reduced from the second to the third wave of questioning. One problem with the panel data is that individuals who participated in the first wave of a panel may drop out in the later waves. This is known as attrition. We mentioned in Chapter 4 that the sample may be biased if the participants are systematically different from the non-participants. This is known as sample selection bias. The sample size has reduced due to reasons mentioned in Section 4.3.2 and the final sample may be biased if the individuals who dropped out of the study are systematically different from those who remained in the sample. This is known as attrition bias state (Cuddeback, Wilson, Orme, & Combs-Orme, 2004, p. 20). (Alderman, Behrman, Kohler, Maluccio, & Watkins, 2001, p. 82) and (Ziliak & Kniesner, 1998, p. 508) pointed out that the attrition bias is not a big issue if it random The attrition rate of our sample was 68.9 percent for the lengthy interval between 2005 and 2012. There are three major reasons for the dropouts: (1) those interviewees who had been part of the control group previously, had received a microcredit meanwhile and had thus to be eliminated from the treatment sample; (2) a number of former interviewees had left the village for good; (3) the last reason was natural attrition. But a high attrition rate does not necessarily imply attrition bias. The socio-economic characteristics of the household in 2002 (the first wave

of the study) are used to compare the dropouts with those who remained in the study. To detect the attrition bias, binary Probit regression is typically used because the outcome modeled is binary (dropout or not). But binary Logit regression and other models can be also used, see for instance (Greene, 2000) who is cited by (Cuddeback, Wilson, Orme, & Combs-Orme, 2004, p. 23). The dependent variable is created with 1 representing those who remained in the study (stayers) and 0 the dropouts.

Table 5.9: Household socio-economic characteristics, 2002 droppouts (D) and stayers (S)

Socio-economic characteristics of households	Mean Droppouts n =125	Mean Stayers n=73	Mean Total sample n =198	Mean difference D-S	P- value
Income per capita CFA franc	74 107	106 073	85 892	31 965	0.257
Gender	0.800	0.780	0.792	0.020	0.748
Age	2.360	2.342	2.353	0.018	0.843
Education	1.344	1.547	1.419	-0.203*	0.052
Ratio	3.296	3.273	3.287	0.022	0.957
Empruntex	0.266	0.373	0.298	-0.107	0.808
Revhors	0.448	0.506	0.469	- 0.058	0.423
Distance	3410	3099	3295	311	0.538
Credit2002	1.496	1.863	1.631	-0.367*	0.103

Source: Own data

Notes: Education: 0; 1; 2 and 3 were given to those who did not attend the school, those who attended the primary, secondary school and university, respectively.

The variable “credit 2002” indicates the number of times that the household has borrowed before and in 2002.

The finding in Table 5.9 indicates that there is a modest significant difference between the two groups with regard to two variables: education and the number of times that a household has borrowed. The variable education is represented by the ordinal numbers (0; 1; 2; 3; etc.). Table 5.9 reveals that on average those who dropped out attended the secondary school which is represented by 1.344 > 1 and those who did not

drop out (the stayers) attended on average the secondary school too, which is represented by 1.547 > 1. The secondary school is represented by the code 2. However the result in the table would have been more precise if the respondents had known the number of years they had attended the school. In Cameroon the primary school lasts six years whereas the secondary school lasts seven years. This is a total of thirteen years. Unfortunately due to the age of interviewees, most of them could not remember the total number of years they had attended the school. The table reveals that on average both groups attended primary school. Therefore, there is no significant difference between those who dropped out and those who stayed regarding the variable education.

The second variable (credit 2002), the number of times that a respondent has borrowed before and in 2002 is represented just like the variable education by the ordinal numbers (0; 1; 2; 3; etc.). The finding in Table 5.9 indicates that the dropouts have borrowed on average 1.496 times (which is more than one time). Those who did not dropout have borrowed in average 1.863 times (which is also more than one time). Hence the average number of times borrowed is two for the two groups (drop out or not). Therefore there is no difference between the two groups. There would have been a difference in case the average time borrowed for the group (drop out) was 1; 2; 3 … times more than the those who stayed (stayers) and vice versa.

Conclusion: The two groups present in wide terms similar characteristics in 2002, hence there is not attrition bias or if attrition bias exists, it is ignorable. In case the attrition bias exists Heckman is used for correction. But the Heckman approach accounts for selection on the unobservables. That is when the cause of attrition bias is not readily apparent (Miller & Hollist, 2007, p. 56).

Let us check the subsample in 2011 to see if the household socio-economic characteristics from treatment and control groups in 2002 and 2011 are still similar.

Table 5.10: Households socio-economic characteristics, 2011

Socio-economic characteristics of households	Mean T n = 61	Mean C n=12	Mean total sample n =73	Mean difference T-C	P (sign. Level)
Income per capita f.cfa	297 035	434 441	319 622	-137 405	0.221
Gender	0.803	0.666	0.780	0.130	0.300
Age	2.606	2.593	2.602	0.013	0.521
Education	1.590	1.666	1.602	-007	0.707
Ratio	3.557	3.416	3.534	0.141	0.790
Empruntex	0.754	0.666	0.739	0.088	0.530
Revhors	0.852	0.750	0.835	0.102	0.380
Distance	3887	2142	3600	1745	0.120
Credit2005-2011	1.967	0	1.643	1.967***	0.000

Source: Own data

Notes: The annual inflation was measured by the consumer price index: http://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?page=1

T represents the treatment group and C the control group.

1 USD ≈ 621 XAF (XAF is the currency code for Francs): http://www.xe.com/en/currency/xaf-central-african-cfa-franc-beac accessed 11th March 2015

Education = Education: 0; 1; 2 and 3 were given to those who did not attend the school, those who attended the primary, secondary school and university, respectively.

The signs *, **, *** represent significance levels at 10, 5 and 1 percent level, respectively.

The results of Table 5.10 indicate that the income per capita for both groups has increased and the treatment group has less income than the control group in 2011. But the result is not significant. The difference in household income is not due to the variation in socio-economic characteristics because there is no significant difference between the two groups with regard to theirs socio-economic characteristics.

Could the reason be the unobserved characteristics?

Why do some households decided to borrow and others decided not to? If only the households with more entrepreneurship borrow, then unmeasured "entrepreneurship" may have an impact of the outcome. Why the MFIs namely the MC^2 are chosen to be located in specific villages? The MFIs are placed according to the communities and individuals interests. Some villages are viewed as more entrepreneurial or have dynamic leaders or simply poorer. These unobserved characteristics may influence our results. The advantage of panel data is that they allow for unobserved heterogeneity. It is useful to

discuss the nature of unobserved effects. That is to know if they vary or not over time. The unobserved effects model can be written as follows (Wooldridge, 2002, p. 251):

$$Y_{it} = \beta X_{it} + v_i + \varepsilon_{it}, \qquad t = 1,2,.....,T, \text{ and } i = 1,2.....,n, \qquad (5.1)$$

Where X_{it} is $1\times K$ vectors containing all the observable variables, v_i is the unobserved heterogeneity controlling for unobserved effects, and ε_{it} represents the error term. Since i indexes the individual, then v_i can be also called individual effect or individual heterogeneity[51]. Should v_i be treated as a random effect (RE) model or a fixed effect (FE) mo1del in the estimation? The RE means the unobserved effects are independent of explanatory variables and they change over time, while the fixed effect indicates that the unobserved effects are correlated with explanatory variables and are constant over time. The null hypothesis indicates the RE and the alternative hypothesis, the FE.

$$\begin{cases} H_0: Random\ Effects\ (Cov\left(X_{it}\ , v_i\right) = 0) \\ H_{1:}\ Fixed\ Effects\left(Cov\left(X_{it}\ , v_i\right) \neq 0\right) \end{cases}$$

However, we do not know if the FE model or the RE model applies in the estimation. Therefore, the Hausman test, developed by (Hausman, 1978), is implemented. The null hypothesis is that the difference in coefficient is not systematic; implying the RE and the alternative hypothesis is that the difference in coefficient is systematic, implying the FE (Jia, 2011, p. 38). The following table presents the result of the Hausman test.

[51] v_i is not part of the error term.

Table 5.11: Hausman test for fixed versus random effects model

Variables	Coefficients		
Income (F.CFA)	(b) Fixed	(B) Random	(b-B) Difference
Treatment	Omitted	-82 029	-
Gender	Omitted	1 009	-
Age	140 775	32 552	108 222
Ratio	15 052	-9 244	24 296
Education	215 148	143 251	71 896
Empruntex	74 520	46 421	28 098
Rehors	39 519	73 999	-34 480
Distance	-10	3	-13
Credit	3 868	14 491	-10 622
Number of obs. =146	Number of groups = 73		P-value = 0.049

Source: Own data

Notes: The signs **, *** represent significance levels at 5 and 1 percent level, respectively.
b = $\widehat{\beta_{FE}}$ = consistent under H_0 and H_1 and B = $\widehat{\beta_{RE}}$ = inconsistent under H_1, efficient under H_0

The Hausman test indicates that the P-value = 0.049 which is less than 5%. This implies that the null hypothesis is rejected (Baltagi, 2005, p. 71) . So unobserved effects are fixed over time and correlated with explanatory variables and therefore yield a biased estimator. To address this problem, the instrumental variable (IV) methods can be used. But if panel data are available, the first differences transformation can be used (Wooldridge, 2002, p. 248). The first differences transformation consists of transforming the model by doing the difference between the t-period and t-1 period.

$$\Delta Y_{it} = \left(X_{it}\beta + v_i + \varepsilon_{it} \right) - \left(X_{i,t-1}\beta + v_i + \varepsilon_{i,t-1} \right) \quad (5.2)$$

$$= \Delta X_{it}\beta + \Delta\varepsilon_{it}$$

Where

$$\Delta Y_{it} = Y_{it} - Y_{i,t-1} \quad (5.3)$$

$$\Delta X_{it} = X_{it} - X_{i,t-1} \quad (5.4)$$

$$\Delta\varepsilon_{it} = \varepsilon_{it} - \varepsilon_{i,t-1} \quad (5.5)$$

The unobserved factors are eliminated and the OLS estimation yields to a consistent estimator $\hat{\beta}$ (Baltagi, 2013).

In the case at hand, we used the Difference-in-Difference matching method instead of the first difference transformation because of the dichotomous dependent variable (treatment and control group) and it used the results of PSM to calculate the changes in household income over time. The following equation, adapted from (Coleman, 1999), gives more details on DID matching.

$$Y_{ijt} = \alpha X_{ijt} + \beta V_j + \gamma M_{ij} + \delta T_{ijt} + \varepsilon_{ijt} \quad (5.6)$$

Where Y_{ijt} is the income for an individual i in a village j at the time t; X_{ijt} is a vector of household characteristics; V_j is a vector of unobserved village characteristics; M_{ij} is a dummy treatment equal to 1 if the individual i in a village j has received the credit and 0 otherwise. M_{ij} can be thought of as a proxy for the unobservable characteristics that lead households to self-select into a microfinance program, that is, it captures unobserved factors that caused ε_{ijt}. T_{ijt} is the number of times an individual has borrowed; α, β, γ, δ are parameters to be estimated, The DID method implies

$$\text{DID} = Y_{ijta} - Y_{ijtb} \quad (5.7)$$

Where" a "is referred to as after the microfinance program intervention (2011) and "b" is referred to as before the intervention (the first wave data 2002)[52].

$$\text{DID} = \Delta Y_{ij} = \Delta X_{ij}\alpha + \Delta T_{ij}\delta + \Delta\varepsilon_{ij} \quad (5.8)$$

The unobserved village characteristics V_j and the unobservable household characteristics that may influence individuals to participate in microfinance program M_{ij} are eliminated. Conclusion: Since unobserved factors are fixed over time (Hausman test), they do not influence our results.

[52] However the Difference-in-Difference method (DID) is used to indicate the stronger evidence on changes in household income of the treatment and control groups at different points in time after (2011) and before (2002) the treatment. That is calculating the average household income for both groups before and after the microcredit program intervention in order to see the real change in income. In the case at hand, the average income in 2002 (the baseline data) is referred to as" before" and the average income in 2011 as "after" the microcredit program (see Section 4.2.2 for more details).

DID is calculated using the results of PSM. The following table calculates the average treatment effect of microcredit program intervention using a DID matching model.

Table 5.12: Difference in household income after (2011) and before (2002)

Income per capita f.cfa (n=73)	Treatment	Control	Difference	t-test
Unmatched	188 808	339 318	-150 510	-1.27
ATT nearest neighbor matching	138 403	392 512	-254 109	-1.53

Source: Own data, STATA, psmatch2, diff

Note: The DID is calculated in this table using the nearest neighbor matching method. The sample size has reduced a lot using the radius matching and kernel matching method.

The results of DID (the difference in income before and after the microcredit program intervention) reveal no significant impact of microcredit on household income over time. The control group is better off than the treatment group. The negative sign does not mean that the microcredit program has a negative impact on borrowers otherwise they could have dropped out.

Before we conclude, it is important to compare the treatment and control groups in terms of relative poverty shares. The dropouts may probably be households with high per capita income in 2002 and 2004. Let us control if the dropouts are households with high per capita income in 2002 and 2004.

Table 5.13: Share of absolute poor (≤ 1.25 USD) in 2002, 2004 & 2011(percent)

	Treatment group	Control group
2002 (n=198)	97.85	100.00
2004 (n=198)	83.50	90.00
2011 (n=73)	64.00	58.30

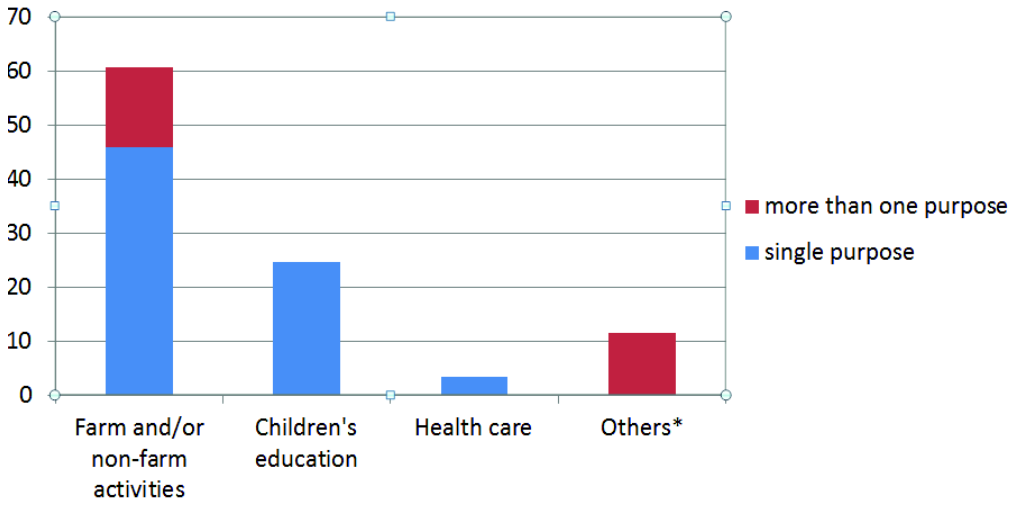
Source: Own data

The results of Table 5.13 reveal two important facts. First, the treatment and the control group started out as being absolutely poor, as defined by disposable income per head and day. Second, over time, the share of people living with less than 1.25 USD has relatively decreased; however, more so in the control than in the treatment group. Therefore, dropouts were not households with high per capita income in 2002. The two groups were absolutely poor in 2002. Households did not probability use the microcredit such that it actually bettered their economic situation.

What was the credit used for?

Let see how the households have used their microcredit. Unfortunately the households could not remember how the total credit was used (from 2005 to 2011), but a least they told us how they used their last microcredit. See Figure 5.1 below for more details.

Figure 5.1: **Use of last microcredit by treatment group (in percent), 2011**



Source: Own data
Others: * = food consumption, funerals, non-durable household assets, etc.

Figure 5.1 indicates that households used their last microcredit not only for income creating farm and non-farm activities. Often they split the credit, directing our attention also to the characteristic of fungibility. The very same microcredit is often split up between income creating activities and issues addressed as consumptive, such as paying for children's education, health care and others − namely food consumption, funerals,

household assets, etc. 70.5 and 83 percent of households have used their microcredit for income creating activities respectively (from the year they joined the microfinance MC^2 till 2002) and (from 2003 to 2004) (Djeudja, 2006, p. 148)[53]. But in 2011, only 46 percent of the households used their last microcredit for income creating activities.

However academic studies that evaluate the impact of microcredit using DID-fixed effects (household and village fixed effects) to correct for self-selection into the microfinance and non-random microfinance placement are presented in the following table. In the case at hand, the Hausman test was used to determine whether unobserved factors are fixed over time or not. Fixed effects assume unobserved household characteristics and village characteristics remain constant over time. Therefore it gets rid of bias issues (Chowdhury & Chowdhury, 2011, p. 89). The drawback of the DID method is that it does not allow for time variant. The instrumental variable is another way to get around the selection bias and it allows for time variant selection bias. But it poses a problem in most samples due to the lack of good instruments (Alexander, 2001, p. 22). Instruments should be carefully selected. Weak instruments can potentially worsen the bias if they are correlated with the unobserved effects or omitted variables affecting the outcome (Khandker, Koolwal, & Samad, 2010, p. 87). The following table presents an overview of some authors investigating the impact of microcredit using DID-fixed effects model to overcome the bias issues.

[53] The first survey was conducted in 2003 and questions regarding the management of credit covered the period (from the year clients have joined the microfinance MC^2 till the year 2002).

The second survey took place in 2005 and questions regarding the management of loan covered the periods 2003 and 2004.

The third survey was in 2012/2013 and questions regarding the management of loan covered the periods 2005 to 2011.

Table 5.14: An overview of microfinance impact using fixed effects to overcome selection bias

Data properties	Author	Outcome variables	Results	Countries
Cross section	(Pitt & Khandker, 1998)[a]	Labor supply, schooling, HH expenditure and assets	Microcredit has a lager effect on poor in Bangladesh, especially on women.	Bangladesh
	(Morduch, 1999)	Labor supply, schooling, HH expenditure and assets	Rejected the positive impact found by Pitt & Khandker (1998). His results revealed no increase in consumption levels or school enrolment of children of the borrowers relative to the non-borrowers. He questioned the validity of the models used and assumptions made by Pitt & Khandker (1998).	Bangladesh
	(Coleman, 1999)	HH income, savings, spending on health care and education, and HH assets	Little positive impact of the village bank (microfinance) on these HH outcomes	Northeast Thailand
Panel data	(Tedeschi, 2008)	Microenterprise profits	Higher significant microenterprise profits on borrowers	Peru
	(Berhane & Gardebroek, 2010)	HH consumption and housing improvements	Significant positive impact on borrowers	Northern Ethiopia
	(Imai & Azam, 2012)[b]	HH income, food consumption, and women's body mass index	Positive impact on HH income and food consumption	Bangladesh

Source: Own data

Note: a) Pitt and Khandker (1998) used the fixed effects with the instrumental variable.
b) They controlled for the self-selection bias on observed characteristics using the PSM.
HH = household

5.4. Chapter conclusion

The goal of this research from the beginning was to follow the households interviewed in 2003 and 2005, and observe the changes in income over time. The challenge to add a third survey round to an existing data set was tremendous. For the first two periods we found that the microfinance intermediary, namely MC^2 had a positive significant impact in 2002 and 2004 on household income. But in 2011, surprisingly, the treatment group displayed a lower average income level than the control group. The DID matching method was used to observe the changes in income over time and the finding indicates no impact of microcredit on household income. Yet, the result was not significant. The finding does not mean that MC^2 has a negative impact on the treatment group, all the more as its services are highly in demand. However, it can imply that a number of the treatment households did not use the microcredit such that it actually bettered their economic situation, therefore they may have lost ground in comparison to the control group. Although the impact of microcredit was significant in 2002 and 2004, microcredit did not move the households from the poverty.

MC^2 was the first microfinance intermediary in the area of study. Therefore most of the local people joined MC^2, often just for safekeeping services of savings (MC^2 was the only place to secure the money). Furthermore, the government is using MC^2 for the payment of civil servants in the rural areas. This is the main reasons why the control group will remain clients of MC^2. The impact of MC^2 may not occur on household income but on other outcome variables such as having savings to pay for health care, children's education, smooth food consumption, etc. MC^2 mainly offers microcredit for income creating activities and children's education.

To fully answer the question of whether the microcredit of MC^2 has had a classical developmental impact in the sense of increased income or not, we must also consider its impact on other relevant outcome variables such as changes in children's education, health care or food consumption levels, to name a few. If the microcredit is used for a purpose other than the ones supported by MC^2, we cannot see its impact on household income and for this reason, we cannot conclude that the microcredit does not have a positive impact. Furthermore, we would like to point out that the findings of the qualitative survey of married women in the following chapter indicate that women who have had the chance to benefit from microcredits of MC^2 state to be more empowered now than before.

6. Microcredit and women's empowerment

In many parts of the world, women continue to lack voice and decision making ability; and their economic opportunities remain limited. That is why promoting gender equality and empowering women is one of the Millennium Development Goals of the United Nations. In Cameroon too, the social and economic status of women, especially in rural areas, remain low. Cameroon is also expected to become a so-called emerging economy by the year 2035 and, in this process, one of the targets of the Cameroonian government is to strengthening the social role and to making women more economically autonomous. One of the vehicles considered by academia and politicians successful in empowering women can be the socio-economic effects as a consequence of microcredit access.

It is generally stated that women represent 70 percent of the world's poor (UNDP, 1995, p. iii). As a result and as a consequence of women's poverty, they continue to lack voice and decision making capacity; and their economic opportunities remain constrained in many parts of the world. Nevertheless, progress has been made over the past quarter century to improve their conditions and "*gender equality is the heart of the development*" said Zoellick [54]in the *World Development Report 2012 on Gender Equality and Development* (World Bank, 2012, p. xiv). Ban Ki-moon[55] (UN Women, 2011, p. 2) also mentioned that:

"*Without justice, women are disenfranchised, disempowered and denied their rightful place. Justice is central to the effort to help women become equal partners in decision-making and development".*

In Cameroon too, the social and economic status of women, especially in rural areas, remain very low. Cameroon hopes of achieving the emerging country status by 2035 and, in this process, strengthening the social role and to making women more economically autonomous is imperative. One of the vehicles to achieve women's empowerment can be microcredit access. Subsequently, microcredit programs have become a widespread

[54] Robert B. Zoellick is the former president of the World Bank.

[55] Ban Ki-moon is the current Secretary-General of the United Nations (UN).

policy instrument aiming at reducing poverty among poor people, particularly poor women, with the skills to become self-employed and raise income (Khandker, 1998). Poor women are a preferred target group of microcredit programs for two reasons: (1) a disproportionate share of them is poor; and (2) policy makers can rightfully assume that the welfare of the whole family will improve when women's incomes rise due to microcredit financed investments (Cheston & Kuhn, 2002, p. 171).

This chapter first discusses the concept of the empowerment of women in Section 6.1 and then investigates the impact of having access to microcredit on women's empowerment for a case study from West Cameroon (Section 6.2). It discusses also the challenges that particularly married women face after receiving microcredit and how they manage them.

6.1. The meaning of empowerment

"*Facilitating empowerment by making state institutions more responsive to poor people and removing social barriers that exclude women, ethnic and racial groups, and the socially disadvantaged*" is one of the crucial actions of poverty alleviation reported in the *World Development Report 2000/2001 on "Attacking Poverty*" (World Bank)[56]. It is generally agreed, that poor people need access to education, basic health care, as well as to land, financial capital, and markets to empower them (Narayan, 2002, p. xvii). However, there remains a question about what empowerment actually means. The term empowerment has no clear definition (Hennink, Kiiti, Pillinger, & Jayakaran, 2012, p. 202). It has different meanings in different socio-cultural and political contexts, and does not translate easily into many languages. It refers broadly to the expressions like "self-strength, control, self-power, self-reliance, own choice, life of dignity in accordance with one's values, capacity to fight for one's right, independence, own decision making, being free, capability, self-confidence and self-worth" (Noreen, 2011, p. 318); (Narayan, 2005, p. 3); (Narayan, 2002, p. 13). Applying this idea to women means that poor women may now be capable of making decisions that can affect their lives and their futures. (Kabeer, 1999, p. 435) states for instance: „*Women's empowerment is about the process by which*

[56] http://wdronline.worldbank.org/worldbank/a/c.html/world_development_report_2000_2001/abstract/WB.0-1952-1129-4.abstract

those who have been denied the ability to make strategic life choices acquire such an ability".[57]

Major recommendations for types of entitlements that especially poor women need to become access to in order to improve their empowerment are: education, employment, gender equality, and control over their lives with regard to feminism (Ferree & Hess, 2000, p. vi). Academia and politicians agree with feminism's idea and add that women's access to productive resources, especially to land and to credit can make them less vulnerable (World Bank, 2012, p. xxii).

6.2. Women and microcredit

Women contribute directly to their children's human capital (nutrition, health and education) and have control over their own lives if they have access to resources (Blumberg, 2005, p. 2). Microcredit programs were founded on the belief that they can be a powerful instrument to fight against poverty (Simanowitz & Walter, 2002, p. 4). Since women are the poorest of the poor, therefore microcredit programs can be an instrument to empower them.

But access to resources in the form of microcredit does not automatically empower women. Microcredit itself is first of all a liability and this liability can only be empowering if there is a means to convert the liability into an asset that is into an income creating activity (Ackerly, 1995, p. 56). Women must therefore be capable to use the resources to meet their aims. They must be significant actors in the process of change (Malhotra & Schuler, 2005, p. 72). Kabeer (1999) calls this process:" *agency"* and (Berger, 1989, p. 1017) added that the microcredit package should be accompanied by training and technical assistance. Overall, the assumption that microcredit empowers women remains controversial and empirical results are mixed. According to (Garikipati, 2010, p. 2) in her review paper entitled" *Microcredit and women's empowerment: Have we been looking at the wrong indicators",* some scholars argue that microcredit has a positive impact on women (e.g. (Rahman R. I., 1986); (Pitt & Khandker, 1998); (Kabeer, 2001) and (Pitt, Khandker, & Cartwright, 2006). Other scholars view such optimism more critical and argue that microcredit can even have a negative impact on women. The negative evaluations find that microcredit disbursed to women whose means are strongly

[57] For more definitions of women's empowerment, see (Ibraham & Alkire, 2007, p. 380).

controlled by their spouses, is even deepening their dependence on their spouses for repayment and in some cases lead to domestic violence if wife and husband compete for the control over the microcredit and the responsibility for repayment is not clearly defined (Goetz & Gupta, 1996); (Rahman A. , 1999) and (Leach & Sitaram, 2002).

6.3. Methodological framework with regard to the microcredit-empowerment nexus of women

This section presents the methodological framework for evaluating the microcredit-empowerment nexus of women. It presents the objectives and hypotheses, the data and the composition of the index for measuring empowerment.

6.3.1. Objectives and hypotheses

Based on the above discussion, this chapter has the following objectives:

- to explore various determinants of women's empowerment;
- to analyze the role of microcredit involved in women's decision making at the household level;
- to discuss the challenges that married women face after receiving the microcredit and how they manage them.

The hypotheses are:

- Microcredit contributes to increasing women's decision making ability with regard to their activities.
- Microcredit allows women to have control over use of income.
- By having access to microcredit, women can increase their self-esteem (for instance, confidence in speaking in the public).
- Married women face new family challenges after having received microcredit.

6.3.2. Data and methods

In this section the conceptual framework for collecting the primary data is briefly outlined. Furthermore, the statistical methods for analyzing the data are described.

Sources of data

This study is the continuation of the one conducted in 10 villages in West Cameroon[58]. The main part of the study investigates quantitatively the impact of microcredit on household income using panel data from three points in time, namely (2002, 2004 and 2011). This chapter examines the impact of microcredit on women's empowerment qualitatively. Using simple random sampling, a total of 107 women were selected and among them, 68 have had received microcredit at least once and were married. The criterion was to select married women who have received their first credit at least three years ago based on the assumption that impact on income due to credit requires a maturity period. Quantitative and qualitative data were collected via household surveys with a questionnaire, carried out from September 2012 to January 2013.

6.3.3. Framework and methods

There are different frameworks or indicators proposed by scholars and practitioners to measure women's empowerment. (Hashemi, Schuler, & Riley, 1996) suggested empowerment indicators such as mobility, economic security, ability to make small and large purchases, involvement in majority household decisions, relative freedom from domination by the family and political legal awareness, and participation in public protest and political campaigning. (Kabeer, 1999, p. 435) proposed a framework relying on resources (material, human or social resources from which the choices are made), agency (the heart of the process by which choices are made) and achievement which is outcomes. (Malhotra & Schuler, 2005, p. 83) adopted the indicators suggested by Kabeer (1999) and added economic, sociocultural, legal, politic and psychological aspects in the household and community level, and also in broader arenas.

In general, however, up to today, there is no rigorous method to measure women's empowerment that can be applied universally across cultures and regions (Cheston & Kuhn, 2002, p. 168)**;** (Hashemi, Schuler, & Riley, 1996, p. 637). Most of the indicators applied to receive a better picture of women's empowerment surround women's ability to make decisions that affect their individual lives and their futures[59].

[58] See Chapter 4 for more details on description area.

[59] For a more comprehensive list of indicators or the basic framework on women's empowerment, see (Malhotra et al. 2002 p. 37-49) in "Measurement women's empowerment as a variable in international development".

In our case study, we use the Women's Empowerment in Agriculture Index (WEAI) adapted from the International Food policy research Institute (IFPRI, 2012, p. 2). WEAI was chosen because it investigates women's capability to make decisions within the household that positively influence their individual lives and their futures. However, it is a tool formed of two sub-indexes:

(1) The first sub-index measures the five domains of empowerment for women−namely resources, activity, income, leadership and time.
(2) The other sub-index measures gender parity in empowerment within the household. It compares women who are as empowered as men in their household.

In our case study, we will only emphasize on the five domains of empowerment for women[60]. Furthermore, IFPRI focused only on women's empowerment in agriculture. In this particular case, the sample is composed of women whose activities comprise farm and non-farm (service, small business and handicraft production) activities. In the case at hand, Women's Empowerment in Activity Index (WEAI) is used instead of Women's Empowerment in Agriculture Index (WEAI). **Erreur ! Source du renvoi introuvable.** outlines the domains of empowerment in more detail. The five domains of women's empowerment in **Erreur ! Source du renvoi introuvable.** are defined as following:

Table 6.1: The five domains of empowerment for women

Domain	Indicators	Points
Resources	• Ownership of assets	0.5
	• Decisions on credit	0.5
Activity	• Decisions in activity	1.0
Income	• Control over use of income	1.0
Leadership	• Group member	0.5
	• Speaking in public	0.5
Time	• Leisure	1.0

Source: Adapted from IFPRI (2012) in Women's Empowerment in Agriculture Index (WEAI)

[60] Because our main focus is to investigate the challenges that married women face when having received a microcredit.

- **Resources:**

Decisions on credit*:* there is a correlation between poverty and disempowerment because an insufficiency of the means for meeting one's basic needs often excludes the capability to make meaningful decisions (Kabeer, 1999, p. 437). Women need access to resources to be empowered. But access to resources alone does not automatically result to empowerment. Women's empowerment is a process of change and they must be significant actors of this change as mentioned earlier. So they must be able to use the microcredit for the purpose they intended it for. Half a point was given if the decision on credit was made by the woman or jointly by her and her spouse. That is if she has a strong control over the credit.

Ownership of assets (e.g.): this point was not our focal issue. Most of women cannot afford to buy a land particularly in the rural area and according to Cameroonian culture, a woman can only inherit assets from her parents if there is not a male (man) in the household. Therefore, women do not have the chance to inherit the land from their ancestors. Nevertheless, it mattered whether women had the ability to use the loan in the intended way as to meet their goals. Another 0.5 point was given if she was the owner of the land (for those whose activity is farming) or owner of the non-farm activity.

- **Activity:**

This variable refers to the woman's capability to make more or less independent decisions over her activities. One point was given if she alone or jointly with her spouse could make decisions concerning her activity.

- **Income:**

This variable refers to the ability of a woman to exercise a substantial control over her income generated from the activity for which the loan was aimed. A woman can be the one making decisions on her resources or activities, but if her spouse controls alone the income generated from her activities, she is not considered as empowered. The fact that the husband strongly controls her income is deepening her dependence on her spouse for repayment. (Goetz & Gupta, 1996, p. 45). One point was given if either the wife alone or she jointly with the husband controlled the income**.**

- **Leadership:**

Group membership: half point was given if the responding women belonged to any economic and or social group in the community. Traditionally there are many types of

self-help credit groups in Cameroon. They are called *Tontine*. The aim is to assist each other financially and socially in good and bad circumstances.

Speaking in public: half a point was given if a woman had a defined responsibility in self-help groups. If she was for example the president or the executive committee member, it implied that she had to speak in front of this group.

- **Time:** half point was given if the interviewed woman had time to rest and another half point if she has time for leisure activities.

A woman is defined as empowered in these five domains of women's empowerment if she achieves four of the five domains. The drawback of WEAI is that, in its sub-index, the five domains of empowerment for women, the credit is included, therefore excluding households without credit for comparison.

6.4. Empirical results with regard to the microcredit –empowerment nexus of married women in Cameroon

In the following section, the empirical results are presented.

Demographic characteristics of the respondents: Table 6.2 presents the demographic characteristics of the interviewed women, differentiated along so-called treatment and control group. The treatment group represents the group of women who have already received microcredit and the control group, those who have not yet received it. For details on the methodological approach in defining these two groups, please refer to Section 4.1. The data is analyzed using the independent t-test for the continuous variables (age, number of dependents) and Chi-square test for categorical variable.

The results show no significant differences between both groups, so the hypothesis that the treatment and control group are comparable is accepted. The average age of both groups is between 31 and 50 years (71.4 percent for the treatment group and 68.75 percent for the control group). The majority of respondents have attended secondary school: 58.24 and 75 percent of the treatment and control group respectively.

Table 6.2: Personal demographic characteristics of the respondents

Demographic characteristics	Treatment group (women with credit)		Control group (women without credit)		Total	p-value
	n	%	n	%	n	
Age						
Below 30	1	1.1	1	6.25		
31-50	65	71.4	11	68.75		
Above 51	25	27.5	4	25		
Total	91	100	16	100	107	.587
Marital status						
Single	2	2.19	1	6.25		
Married	69	75.8	10	62.5		
Widowed	19	20.88	4	25		
Separated	1	1.1	1	6.25		
Total	91	100	16	100	107	.330
Education						
None	2	2.2	0	0		
Primary	31	34.1	4	25		
Secondary	53	58.24	12	75		
Academic	5	5.49	0	0		
Total	91	100	16	100	107	.532
Number of dependents (average)	5.99	-	5.5	-	-	.440

Source: Own data

Women's empowerment: the results of the five domains of empowerment for women are discussed in the following table. Using the Chi-Squared test, the results of Table 6.3 reveal that women either decide alone or jointly with their husbands on how the credit and (hopefully) subsequent income are used. Almost 62 percent of the responding women claim to control alone their incomes. They don't consult their husbands before making decisions over their incomes. It is likely that they are involved in polygamous families. In such family structures, the husband does not always have time to control everything his wives do. We found that 75 percent of the women achieve four of the five domains of women's empowerment and it is significant. After explaining to the respondents what we understand by women's empowerment, we asked their own opinion about women's empowerment and a similar large share, namely 72 percent of them thought that they are empowered.

Table 6.3: Empirical results of the five domains of women's empowerment

Variables	n	%	χ^2
Decision on how to use the credit:			
• Self		42.6	
• Spouse		0	
• Self and spouse jointly		57.4	
• Total	68	100	1.741
Are you the owner the land used or owner of the non-farm activity			
• Yes		51.5	
• No		48.5	
• Total	68	100	0.059
Decision on your activity:			
• Self		42.6	
• Spouse		0	
• Self and spouse jointly		57.4	
• Total	68	100	1.741
Decision on how to use the income			
• Self		61.8	
• Spouse		0	
• Self and spouse jointly		38.2	
• Total	68	100	3.765**
Membership in any group			
• Yes		97.1	
• No		2.9	
• Total	68	100	60.235***
President, executive committee member etc. in the group?			
• *Yes*		73.5	
• *No*		26.5	
• *Total*	68	100	15.059***
Time for leisure			
• *Yes*		60.3	
• *No*		39.7	
• *Total*	68	100	3.765**
Total women's empowerment			
• *Yes*		75	
• *No*		25	
• *Total*	68	100	17.00***
After explaining the five domains of women's empowerment, do you think you are still empowered?			
• *Yes*		72.1	
• *No*		27.9	
• *Total*	68	100	13.230***

Source: Own data

Notes: The signs *, **, *** represent significance levels at 10, 5 and 1 percent level, respectively

Challenges facing married women after having received the microcredit:

The following table indicates the family challenges married women face when having received the microcredit. Using the Chi-Squared test, 33.8 percent of married women complained that the loan can be a source of problems in their households. Among them, 32.4 percent state that once they receive credit, their spouses do not longer financially assist them and their children as they used to do. During the interview, most of the husbands of responding women said that:

The microfinance intermediary MC² has improved the economic status of our wives and they do not longer financially depend on us. It allows them to make decisions within the household. But when our wives did not have money, as the head of the family, we (men) had to take care of everything (household expenses, children school fees etc.). Now that they (women) are financially autonomous, they have to financially contribute for the household. And it is in this phase that we (couples) enter into disagreement of who is responsible for which task in the household and end up quarrelling. Women's access to resources appears to be going against the cultural and social roles that we (husbands) expect them to play (they do not longer listening to us (men) but instead they do what they want, when they want and how they want). We (men) find it normal that married women with own income can take care of themselves and also pay for the school fees of their (our) children. This is what we understand by women's empowerment. But women seem to misunderstanding what empowerment means.

Slightly more than 4 percent of the responding women affirmed that their loans were taken over by their husbands. The microfinance literature reports such occurrences for instance for Bangladesh and relates it somewhat to the fact that microcredit programs have an effect on men's violence against women (Schuler, Hashemi, & Badal, 1998, p. 148). They admitted that there is a correlation between microcredit access, women's economic and social dependence on men, and men's violence against women. They added that providing resources to women may provoke violent behavior in men because they see their authority over their wives being undermined and end up beating them before taking over the loan. In our case study, the responding women stated that their spouses took over their loans without aggression. 25 percent of the responding women acknowledged that they borrow for their spouses and among them; about 3 percent complained that their husbands never refunded the loan. They said:

There was nothing we could do. He is the father of the children and money cannot break our marriage. We remained calm and looked for the repayment elsewhere. One of them added that: *my husband personally asked me if I can refund all he has been expending on me.*

Microcredit can improve the economic situation of women and offers them potentially the capability of making decisions that can affect their lives and their futures and therefore their well-being in a positive way. But access to microcredit can give more power to women within the household that might go against the cultural and social norms and therefore creating tension, and conflict at the household level.

However, how do they manage this family challenge? Men affirmed that*: without microfinance program, there used to be peace in the house. We (men) only hope that the microfinance program will advise them and lets them know the real meaning of women's empowerment in the Cameroonian context.* If the microfinance program has to get involve into family issues, to sensitize its clients on marital affairs, it will increase its interest rates. If these additional costs are not covered by the borrowers or the public transfers, therefore they will jeopardize the promise of microfinance− namely reduce poverty and be financial sustainable. To overcome this family challenge, the government intervention is needed.

Table 6.4: Challenges facing married women after receiving the credit

Variables	n	%	χ^2
The idea of participating in the credit program was coming from …			
• Self	35	51.5	
• Someone else	33	48.5	
• Total	68	100	0.059
Is the credit a source of problems in your household?			
• Yes	23	33.8	
• No	45	66.2	
• Total	68	100	7.118**
If yes, what kind of problems?			
The husband took the loan.			
• Yes	3	4.4	
• No	20	29.4	
• Total	23	33.8	12.565***
He does not pay anymore the school fees of children or other family obligations			
• Yes	22	32.4	
• No	1	1.5	
• Total	23	33.8	19.174***
Is the credit often diverted to family needs?			
• Yes	29	42.6	
• No	39	57.4	
• Total	68	100	1.471
Do you borrow for your husband?			
• *Yes*	17	25	
• *No*	51	75	
• *Total*	68	100	17.000***
If yes, does the husband always pay the loan back?			
• Yes	15	22.1	
• No	2	2.9	
• Total	17	25	9.941**

Source: Own data

Notes: The signs *, **, *** represent significance levels at 10, 5 and 1 percent level, respectively.

6.5. What this chapter is not about

This chapter is not an exhaustive description of what microcredit and women's empowerment are all about. We only observed the impact of microcredit on women who

have already got the microcredit from a specific program neglecting those who have not yet received it. In general to evaluate the impact of a program on outcomes, most of the studies compare the control group with the treatment group. Instead, the Women's Empowerment for Activity Index (WEAI) focuses on woman's capability to have control on her credit, woman's ability to exercise a substantial control over her income generated from the activity for which the loan was aimed. In other words, WEAI emphasizes the ability of women to make decisions that affect them and their families after having received a credit. Additionally the consequences of the microcredit at the household level, namely the challenges that married women face after receiving the microcredit are very important to underline.

We equally neglect that some unobserved characteristics can influence women to become empowered. The data was collected at one point of time, the longitudinal analysis would have provided us more information and its advantage is that, it allows for unobserved heterogeneity.

6.6.Chapter conclusion

The main part of this dissertation investigates quantitatively the impact of microcredit on household income using longitudinal data and we could not find a significant impact of microcredit over time. This chapter examines the impact of microcredit on women's empowerment using qualitative data that was collected at one point in time. Our finding is that there is a significant relationship between microcredit and women's empowerment. On the basis of IFPRI's Women's Empowerment in Agriculture Index (WEAI), we constructed a women's empowerment in activity index and found that 75 percent of women achieve four of the five domains of women's empowerment. This finding suggests that women's access to economic resources (microcredit) can enable them to make decisions that affect them and their families. Ideally the use of longitudinal data approach would have provided us more information on the real changes in women's empowerment over time.

By way of summary, access to microcredit appears to strengthen the social role and to make women more economically autonomous in Cameroon. But much more needs to be done to complement these efforts. Providing credit to women may provoke violent behavior in men because they see their authority over their wives being undermined and end up beating them before taking over the loan (Schuler, Hashemi, & Badal, 1998, p.

148); (Wrigley Asante, 2012, p. 357). Optimizing the beneficial effects of microcredit on the lives of married women and creating an enabling environment for them without tension and violence need serious rethinking (Ahmed, Chowdhury, & Bhuiya, 2001, p. 1965). Furthermore, the household needs to be sensitized on the impact of women's empowerment at the family level and gender equality needs to be addressed at the household level, otherwise socio-cultural norms will remain a handicap for rural women.

7. Conclusion and recommendations

It is generally acknowledged that one cause of poverty in developing countries may be the lack of productive capital for income creating activities. Often, poor people do not have access to commercial banks because they are perceived as being not bankable. For this reason, the so-called vicious cycle of poverty cannot be broken open: people are poor, therefore, they cannot save, because there are no savings, there are little investments, due to a lack of investments, productivity is low, income growth is low, and people remain poor. Given the situation, rethinking on how to provide financially sustainable fashion financial services to the poor, especially in rural areas, was imperative.

The following, discussion will address a general review of this monograph. In section 7.2 the main findings will be presented and in section 7.3 the recommendations and conclusion are given.

7.1. A general review of the dissertation

Reduce poverty and strengthen the social role and economic situation of women are very important for Cameroonian's government to achieve the emerging country status by the year 2035. Academia and politicians believe that microfinance, particularly microcredit is one of the instruments to alleviate poverty in general and empower women in particular. The objective of this research is to evaluate the impact of access to microcredit on poverty in general and particularly with regard to the empowerment of women. The study was conducted in the West Province of Cameroon and the data were collected among clients of the microfinance intermediary called *Mutuelles Communautaires de Croissance* (MC^2 or in English the Community Growth Mutual Funds).

The main hypothesis of this work is that microcredit can play an important role for raising the income of rural poor households and to empowering women. The overall research questions are: how robust is the evidence that access to microcredit reduces household poverty? What are the consequences of microcredit on married women? The hypotheses are as follows:

- Microcredit has a significant positive impact on household income.
- Microcredit contributes to the empowerment of women, specifically their decision making ability with regard to their activities and income.
- Married women face new family challenges after having received microcredit.

To achieve our objectives, quantitative data were collected via household surveys with an identical structured questionnaire, carried out in three point of time−namely 2003, 2005 and 2012/13. Panel data is considered to better reveal evidence on changes in household income. To examine the impact of microcredit on women's empowerment, additional qualitative data was collected in 2012/13.

The main issue to evaluate the impact of microcredit on household income was to find a good counterfactual. The counterfactual indicates what would have happened to the beneficiaries of microcredit (called the treatment group or borrower group) if the microcredit program had not existed. We have to think about what might have happened to them in the absence of this program. Therefore a control group (called non-borrower group) was constructed for comparison. Once both groups are built, we compared their average income. Before we compared the income of the borrower and the non-borrower, we must insure that both groups are very similar in their characteristics so that those who received the treatment (namely the microcredit) would have had incomes similar to those who have not yet received in the absence of microfinance program. The propensity score matching method (PSM) was used to construct the comparison group. The propensity score is the probability to receive the treatment (microcredit) and it varies from zero to one. The basic idea of PSM is to find in a large control group those who are similar to the borrower group based on the propensity score using the observed characteristics and then compare their average income.

The Hausman test indicated that the unobserved factors are fixed over time, therefore the difference-in-difference matching method (DID) was used in order to indicate the changes in household income of the treatment and control groups at different points in time. The DID is only applied when at least two period datasets are available. It calculates the average household income for both groups before and after the microcredit program intervention. In the case at hand, since we don't have data before the existence of the microfinance program known as MC^2, the database 2002 was referred to as "before the program intervention" and the data from 2011 were referred to as "after the program intervention". The inconvenience of PSM is its assumption that the assignment to the treatment is only due to observed characteristics. That is, only observed characteristics

can influence individuals to receive the treatment (microcredit) and which is not always the case. Both observed and unobserved characteristics can have an influence of borrowing. The drawback of the DID method is that it cannot allow for unobserved characteristics that vary over time.

To measure the potential women's empowerment, the Women's Empowerment in Agriculture Index (WEAI) was adopted from the *International Food Policy Research Institute* (IFPRI). The WEAI is a tool that measures the five domains of empowerment of women (which are the resources, activity, income, leadership and time) and gender parity in empowerment within the household. This research only emphasize on the five domains of empowerment for women because the objective of this second part is to investigate the challenges that married women face when having received a microcredit and not to look at the gender parity (women who are as empowered as men in their household). Furthermore, IFPRI focused only on women's empowerment in agriculture. In the case at hand, the sample is composed of women whose activities comprise farm and non-farm (service, small business and handicraft production) activities. Therefore Women's Empowerment in Activity Index is used instead of Women's Empowerment in Agriculture Index. Instead of comparing the outcome of the treatment group with the control group, WEAI focuses on what happens within the household once women have received credit. In other words it analyzes the role of microcredit involve in women's decision making at the household level. Additionally, we observe the connection between microcredit access, women's economic and social dependence on men, and men's violence against women. On the one hand, microcredit access can empower women (that is improving their economic status and offer them potentially the capability of making decisions within the household). On the other hand, microcredit may provoke violent behavior in their husbands because they are afraid of losing their authority over their wives (Schuler, Hashemi, & Badal, 1998).

7.2.Major findings

Access to microcredit is hypothesized to increase household income. To evaluate the impact of microcredit on household income, it was very important to construct the control group, those who have not yet received a loan and compare them with those who already have a credit. Then their average income was compared for the three periods − namely 2002, 2004 and 2011.

The results revealed that microcredit has had a significant positive impact on per capita income for the first two periods (2002 and 2004) but in 2011 (as compared to 2002 and 2004), we could not find any more a significant impact. The control group is better off than the treatment group. We controlled for the difference in income before and after the program intervention using the Difference-in-Difference matching method (that is observing the changes in income over time). The finding is that the control group is still better off than the treatment group. What could be the reason?

- The first intuition was that, the mixed results may be due to the variation in socio-economic characteristics. That the household characteristics have changed over time. We matched again the control group with the treatment group in 2011 to be insured that they are similar. After matching, there were no longer systematic differences in the distribution of covariates (household characteristics) between the treatment and control groups. And again the results revealed no significant impact of microcredit on household income. The control group was still better off than the control group.
- Another reason could be the unobserved household characteristics (for example, entrepreneurial ability): the unobserved characteristics may influence households to receive the microcredit. Biases coming from unobserved household characteristics may affect our results. However, we controlled the nature of unobserved characteristics and found that they were fixed over time. Therefore the DID matching method was used and the hidden biases coming from unobserved characteristics are eliminated through the difference.
- Another reason could be due to the sample size which had drastically reduced in 2011. The fundamental issue with the panel data is the dropout rate (attrition). The attrition rate of our sample was 68.9 percent for the lengthy interval between 2005 and 2012/13. Three major reasons account for this: (1) Those among the control group who got a microcredit had to be eliminated from the treatment sample; (2) A number of people were nowhere to be found because they had left the village; (3) The last reason is natural attrition. The attrition bias arises if individuals who dropped out of the study are systematically different from those who remained in the study. This attrition bias may make the interpretations of estimates problematic. (Alderman, Behrman, Kohler, Maluccio, & Watkins, 2001, p. 82). In the case at hand, the dropouts and those who remained in the study presented the similar

characteristics at the first wave of the study (2002), hence there is not attrition bias or the attrition bias exists but ignorable.

- Who are the dropouts? We found that dropouts were not households with high per capita income in 2002. The two groups were absolutely poor in 2002 and 2004. Households did not probability use the microcredit such that it actually bettered their economic situation.
- What was the credit used for? Our finding is that households used their microcredit not only for income creating farm and non-farm activities. The same microcredit is used for income creating activities, children's education, health care and others − namely food consumption, funerals, household assets, etc. Only 46 percent of the households used their last microcredit for income creating activities.

To fully answer the question of whether the microcredit of MC^2 has had an impact on household income or not, we must also consider its impact on other outcome variables such as changes in children's education, health care or food consumption levels, to name a few. If the microcredit is used for a purpose other than the income creating activities, it is hardly possible to detect a causal impact on household income and for this reason, we cannot conclude that the microcredit did not have a positive impact on people's lives.

The second part of this research investigated the role of microcredit involved in women's empowerment and discussed family challenges that married women may have faced due to their access to MC^2 microcredit. We found that microcredit can make a significant contribution to the women's empowerment. Seventy-five percent of the women achieve the Women's Empowerment in Activity Index (WEAI). Women either decide alone or jointly with their husbands on how the microcredit and (hopefully) subsequent income are used. Most of the women have full control on the use of their microcredits and incomes, but ask for advice from their spouses. Microcredit can improve their economic status and offers them potentially the ability of making decisions that can positively impact their lives and their futures and therefore their well-being. But access to microcredit may, however, also bring about problems: A third of the married women confirmed that their microcredit had been a source of domestic conflicts. They stated that once they received the microcredit, their spouses do not longer financially assist them and their children as they used to do. Furthermore access to microcredit can give more power to women within the household that might go against the cultural and social norms and therefore creating conflict at the household level.

To confirm or refute women's affirmation, some husbands of responding women actually revealed in the absence of their wives that women have misunderstood the traditional meaning of women's empowerment. For them, women should financially contribute to the household expenses and continue respecting cultural and social norms. Women need to be sensitized on the impact of women's empowerment on their spouse.

Slightly more than 4 percent of the responding women stated that their loans were taken over by their husbands without aggression and were never be refunded. And given this situation, women reported that:

There was nothing we could do. He is the father of the children and money cannot break our marriage. We remained calm and looked for the repayment elsewhere. One of the women stated that*: My husband personally asked me if I can refund all he has been expending on me.*

7.3.Recommendations and conclusion

Within the last two decades, the microfinance movement has reached millions of low-income people and in 2006, Prof. Mohammad Yunus was awarded the Nobel Peace Prize for his efforts to create economic and social development from below through microcredit provided by the Grameen Bank in Bangladesh, which he had founded. However, the achievement of such a movement remains controversial. There exists no unanimous view regarding the impact of microfinance. This research revealed a significant positive impact of microcredit on household income in 2002 and 2004 and in 2011, we found no significant impact. We controlled for the difference in income before and after the microcredit program intervention in the treatment and the control group using the difference in difference matching method, still we found no significant impact. This controversy may be due to the chosen quantitative outcome variable of this research, which was household income. However, households do not only use the microcredit for income creating activities. The same microcredit is often split up between income creating activities and issues addressed as consumptive, such as children's education, health care and others. Furthermore, up to today, there is no rigorous method to measure the impact of microcredit on household outcome. Subsequently, it may not be a surprise that empirical results are mixed. The problem may lie on methodological framework used. Generally most of studies that evaluate the impact of microcredit are based on cross sectional data and/or on a few outcome variables−namely changes in children's

education, household income, women's empowerment, food consumption, household emergencies (sickness, natural catastrophes. etc.), large household expenditures (funerals, weddings etc.), to name a few. A simultaneous evaluation of microcredit on such outcomes and a universal methodology may enlighten and provide us more information on the real impact of microcredit. So far the conclusion drawn from this ongoing debate (on the impact of microcredit) is that it has beneficial economic and social impacts on the poor, but doesn't improve their lives as much as is often claimed (Hulme & Mosley, 1996), (Mosley & Hulme, 1998), (Buchenrieder & Heidhues, 2005). The fundamental question is: what strategies can be taken to improve the efficacy of microcredit particularly in Cameroon?

Actions taken by the Cameroonian's government and microfinance institutions (MFIs) themselves can response to this question. In the following, the discussion will address specific recommendations and conclusions regarding MFIs and government policies.

7.3.1. Actions taken by MFIs to improve their efficacy

MFIs should increase their ability to reach the poor, in particular the poorest and achieving financial self-sufficiency. This can be achieved by:

- Improving their financial deepening. Financial deepening means the expansion in (cost covering) financial transactions of all kinds, the provision of more services (not just loans, savings, insurance and payment services) to reach broader clienteles. That is increasing the stock and variety of financial instruments for financial intermediation. Creating market-oriented products that respond to community needs will affect outreach, which in turn influences financial sustainability.
- Improving financial intermediation services requires more investments into staff training. MFIs should put more emphasizes on having their services scientifically accompanyed. Great importance should be attached to the continued (vocational) training of the staff with the expectation that they can bring some innovations. Furthermore, MFIs should provide social intermediation services to increase their outreach: The clients of MFIs should follow training programs – namely basic literacy programs, training in enterprise management, education in health and nutrition. But supplying social intermediations services increases operating costs,

therefore jeopardizing financial sustainable. If these costs are not covered by the recipients of the services, the MFI clients or by public transfers or private donations, obviously the MFIs will have to increase their interest rate. Thus, normally government intervention will be needed. Efforts have been done in this regard. The Cameroonian government trains agricultural extension workers, who in turn train farmers. Most of clients of MC^2 follow this training. But still much remains to be done.

- Satisfaction of client, education and motivation are imperative for a successful implementation of MFIs. The five preconditions for the success of marketing financial services are competitive advantage, compatibility with others indigenous institutions, simplicity, adaptability, observability and communicability (Engel, Blackwell, & Miniard, 1993) cited by (Schrieder, 1996, p. 251). MFIs mainly offer services such as microcredit, savings, money transfer, micro insurance and mobile money. So a MFI that will succeed to create financial innovations, which are adapted to the client needs and compatible to other indigenous institutions, will have a competitive advantage as compared to the existing ones. Given that most of clients in rural areas are illiterate, MFIs operating in such areas should offer services that are easy to understand and to use. Observability and communicability are also important. The new service (innovated product) should be attractive, visible and communicative: that means that the new service should have the ability of getting the attention of the user's entourage. MFI that respects its client base, has a comparative advantage, offers services that are attractive, simple to understand and to use, and adapted to its clients, will have better outreach, which may in turn lead to financial sustainability.
- The procedure to obtain a loan is very long and complex in the MC^2. The staff takes a lot of time to evaluate the project of which the loan is requested for and at the end, borrowers obtain the loan late. What is the necessity of a loan which was aimed to purchase agricultural inputs and is granted to the farmer after the harvest period? Obviously this loan is going be used for purposes others. This delay compels its members to turn to usurers or RoSCAs for urgent needs.

7.3.2. Role of the government in microfinance

The success of MFIs is the hands of the government. The government should play an important role to permit MFIs to meet their promises.

- The state should maintain the macroeconomic stability. Macroeconomic instability negatively affects economic growth and constraints productive economic opportunities. Exchange rate volatility and inflation uncertainty adversely influence the foreign direct investment (Udoh & Festus O. Egwaikhide, 2008). The government of Cameroon has maintained its inflation at about three percent since 2005.
- Avoid interest rates ceiling that reduce the capability of MFIs to cover their operating costs and which in turn influences their commitments to achieving financial self-sufficiency.
- The government should play a protective role for the improvement of MFIs by setting regulatory frameworks that stimulate and encourage the expansion of MFIs particularly in rural areas and secure people savings. The state should play an important role by implementing a favorable fiscal regime for MFIs that will permit MFIs to increase their outreach and serve poor people. Such regulation may stimulate foreigners to invest in rural financial institutions.
- It is vital for a mother that the water she drinks is clean and available, so that she and her children do not get sick, that her children have least electricity to study, for formers to have available roads to get their goods to the market, etc. Roads, electricity supplies, telecommunications, health care, educational facilities, markets facilities are very limited in rural areas although they are of crucial importance to stimulate growth. The state should improve access to markets and infrastructure. What would be the necessity for MFIs to operate in rural areas if a borrower is sick and there is not hospital in the village or the quality of the road leading to the hospital is very bad. MFIs grow better if basic rural infrastructures are available. (Meyer & Nagarajan, 2001) argued that such infrastructures reduce risks and transaction costs for MFIs and provide incentives for innovations, diversification and expansion of microfinance quoted by (Dhakal, 2010, p. 2).
- Microfinance intermediaries benefit from subsidies. The donor should evaluate the opportunity cost of subsidizing microfinance. If subsidies generate more social value (poverty alleviation) than alternative social investments, thus MFIs can continue

receiving subsidized credit, particularly the rural MFIs. However, (Morduch, 2005, p. 2) suggested that some MFIs need subsidies for the start-up. But the subsidy should be limited to the first 5-10 years of operation: the so called “smart subsidy”.

- Strengthen the social role and economic status of women is one of the focuses of Cameroonian’s government to achieve emerging market status by 2035. The government thought that the microcredit program is one of the solutions, but this same microcredit program may become a source of conflict within the household. Therefore rethinking on how to increase the beneficial effects of microcredit on married women is critical. Furthermore, improving the image of women through gender equality needs to be addressed; otherwise socio-cultural norms will remain a handicap for rural women.

Finally, we can conclude that various actors can play an important role for the success of microfinance intermediaries, not only the government but also private organizations such as NGOs. A synergy should exist among MFIs, the state and NGO for the better future of microfinance. The government and NGOs should provide social intermediation services to enable MFIs to increase their outreach, which in turn positively affects their financial sustainability. The government should maintain the macroeconomic stability, implement appropriate regulatory frameworks to stimulate the expansion of MFIs particularly in rural areas, improve infrastructures and the image of rural women by helping them to become equal partners in decision making at household level otherwise the socio-cultural norms would limit the beneficial effects of microcredit on the life of married women.

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Appendices

Questionnaire

Survey period: September 2012-January 2013

Name of MC^2_____ Date of interview _____

Name of the interviewer_____

Only clients of microfinance MC^2 are interviewed and not the household members

SECTION 00: SOCIO-DEMOGRAPHIC INFORMATION

Q1	Type of client [61] 0= cohorte 0 1= cohorte1	|__|
Q2	Name and account number of client	
Q3	Size of household (excluded visitors less than de 06months)	|__|__|
Q 4	Nomber of dependants	|__|__|
Q5	How many of household members have a job that gives them regular income?	|__|__|
Q6	Gender : 1=male 2=female	|__|
Q7	Age of the client (in years)	|__|__|
Q8	Marital status 1 = single 2 = married 3 = widow 4 = separed/divorced 5 = living in common-law relationships	|__|
Q9	Religion: 1=christian 2=muslim 3=animist 4=other…….. 5=no religion	
Q10	For how long have you been the member of MC^2?	|__|__|
Q11	Distance between your house and MC^2	|__|__|
Q12	Distance entre your main activity and MC^2	|__|__|

[61]- Treatment group : clients with credit = cohorte 1
Control group: clients without credit= cohorte 0

SECTION 01: HEALTH AND NUTRITION OF THE CLIENT

Q1	Your current health status 1=good 2=okay 3=bad	└┘
Q2	Were you sick in the last 3 month? 1 = yes 2 = no⇒Q6	└┘
Q3	Did you have a consultation for this disease? 1 = yes 2 = no⇒Q6	└┘
Q4	If yes where? 1=Public 2= Para public 3=Private	└┘
Q5	How much did it cost?	
Q6	What types of health care system do your household use? 1=tradition system 2=hospital 3=Pharmacy 4= other *(multiple answers possible)*	
Q7	Annual health care expenses (2011)	
	Nutritional status	
Q8	Is your household capable to have three meals per day and every day 1=yes 2= no	└┘
Q9	Is your household able to eat meat or fish at least every 3 days 1=yes 2= no	└┘
Q10	Annual expenses on food consumption (excluding food from your activity)	

SECTION 02 : EDUCATION

Q1	Education of the client (year of school)		└┘
Q2	Can you read? 1=yes 2= no		└┘
Q3	Can you write? 1=yes 2=no		└┘
Q4	How many of school –aged children do you have?		└┘└┘
Q5	How many of them do not attend school? *Go to question Q7 if all of them attend school*		└┘└┘
Q6	Why do they not attend the school? 1=no money/school is expensive 2=lack of nearby school 3=voluntary refusal 4=Help with household tasks 99=don't know 5= others ----------- *(multiple answers possible)*		└┘└┘
Q7	What types of school attend you children? 1 = Public 2 = Private 3= Para public		└┘
Q8- school expenses for the children (2011)		Details	
		School fees	
		School uniforms, school supplies	
		Others …………	
		Total	

SECTION 03: HOUSING AND HOUSEHOLD ASSETS

	Housing characteristics		
Q1	To whom belongs the house?	1=rent, 2=parents/friends, 3=me ⇨ Q3	
Q2	Annual amount of rent		
Q3	Main source of supply of drinking water	1= individual tap water, 2=collective tap water 3= public standpipe 4=borehole, 5= protected dug well , 6= River/lake , 7= Rainwater, 8= other	
Q4	Main source of electricity	1= Kerosene lamp 2= Electricity from the state 3= other	
Q5	Main source of energy used for cooking	0=don't cook 1=wood 2=Gas 3=other	
Q6	Main type of WC used	1=WC modern 2=Traditional WC 3=other	
Q7	Main material of your walls	1=modern 2=Timber 3= Earth, 4= Mats/leaves 5=other	
Q8	Main material for the roof	1=Cement 2=sheet metal 3=Mats/leaves 4=other	
Q9	Main material of your floor	1=Cement 2=Modern 3=Earth 4=other	
Q10	Are paying the mortgage? What is the amount including the interest rate?		

Housing assets					
Write the code of the equipment	Do you have such assets? 1 = yes 2 = No		Number	How much did you buy them?	Estimate the current value of your assets
Code	Assets				
1	Land				
2	Car				
3	Motorcycle				
4	Bicycle				
5	Radio				
6	TV				
7	Telephone				
8	Internet				
9	Fax				
10	Camera				
11	Electric stove				
12	Electric oven				
13	Refrigerator/Freezer				
14	Air conditional				
15	Sofa				
16	Cupboard				
17	Other				
18					
19					
20					
21					
22					

SECTION 04: ECONOMIC ACTIVITY AND INCOME OF THE CLIENT (Income 2011)

Q1	What is your main activity? 1=Agriculture/livestock 2= trade 3= civil servant 4=service 5=other …………………		|_|
Q2	What is the main method of remuneration in your main activity? 1=fixed salary 2=profit/loss (business) 3=no fixed salary 4= in kind 5=other		|_|
Q3	For your main activity, how much did you earn per month (year)/estimate your income per month (year) including in kind Income per month 01 = less than 23 500 Fcfa 02 = [23 500 - 47 000 [03 = [47 000- 94 000 [04 = [94 000-188 000 [05 = [188 000- 376 000 [06 = [376 000- 752 000 [07 = 752 000 Fcfa and more income per year 08 = less than 200 000 Fcfa 09 = [200 000- 400 000 [10 = [400 000- 800 000 [11 = [800 000- 1 500 000 [12 = [1 500 000- 3 000 000 [13 = [3 000 000- 5 000 000 [14 = 5 000 000 Fcfa and more	Code Amount	|_|_|

Q4-what is your status in the main activity? 1 = owner 2 = tenant 3= family 4=spouse 5=other …………………

Q5-Information on business (non agricultural activity)

Sales	Week			Month			Total annual
	Min	Max	Average	Min	max	Average	
Cash							
Credit							
Consumed merchandise							
Total							

Q6- Total costs for the non-agriculture activities

Type of expenses	Cost per Week	Cost per month	Total annual
Purchase merchandises			
Rent			
Hired labor			
Tax			
Cost for electricity			
Water			
Transport			
Total			

Agriculture production

Agriculture production (Main crops)	Surface of area in ha	Harvest Kg	Quantity sold	Monthly sales (amount)			Total sales annual
				Min	Max	Average	
Substance crops (maize, potato, casava,cocoyam, plantin, etc.)							
Cash crop (cacao, coffee, etc.)							
Others : fruits, vegetables…							

How did you spend your harvest?

Type of crops	Consumption		Seed saved		Stock		Waste sold		Total annual
	Quantity	value fcfa	Quantity	value	Quantity	Value	Quantity	Value	
	Total		Total		Total		Total		

Indicate your expenses for agriculture

Type of crops	Seed purchased	Fertilizer	Insecticide Herbicide	Location of machinery and others	Transport	Labor	Hired labor	Other	Total annual
Total									

Livestock breeding

Animal	How many animals did/do you own?		Annual purchase		Number sold (included donation and others)		Annual consumption		Annual loss (theft, death)	
	Past season	Currently	number	Amount	number	Amount	Number	Amount	number	Amount
Cattle stock										
Goat										
Pig										
Sheep										
Etc.										
Poultry										
Others										

Livestock breeding expenses

Element	Amount	Element	Amount	Total annual
Medical treatment		Electricity		
Veterinary		Tax		
Fodder		Other ……		
Labor force				
Transport				
Water				
Rent				

Estimate your annual profit from the main activity:……………………………………fcfa

Do you have a secondary activity? 1= yes 2=no

If yes what is your secondary actvity……………………………………………………

<u>If you have a secondary activity, complete the above tables corresponding to your secondary activity</u>

Estimate your annual profit from the secondary activity:…………………………………………fcfa

SECTION 05: ADDITIONAL INCOME (2011)

Q1: A part from the activity generated income do you have additional income? 1 = yes 2 = No	1 = yes 2 = No	annual amount
A- Pension (retired pay)		
B- pension due to an accident		
C -pension to widows or orphans		
D- rent: house/land		
E- Occasional income in cash and in kind (winning a lottery, found or picked up money, reimbursements received from insurance, land sold, house, heritage ...)		
F- Annual -income contributed by other household members (spouse (s), siblings, children, friends, other transfers		
G- other		
Q2: Do you have any changes in income as compared to 2010-2011? 1= increase 2= stay the same 3= decrease		└┘
Q3 what are the causes? A= because of the illness B-because of the illness or death of one of the members of the household C- because of a natural disaster D-because one of the members of the households lost her/his job E- because of poor agricultural season F-because of a lack of credit G- because of the decrease in demand (sales)	H- because of the development of the existing activity I-sales in additional markets J- due to the increase in demand (sales) K- due to the hiring of a household member L-because of a good agricultural season M-due to the unknown reasons N- due the financial assistance from family O:other..............................	

Do you have additional income from animal production? 1= yes 2=no If yes, complete the table below

Element	Sales			Additional expenses			Profit
	week	month	Annual	Week	Month	Annual	Annual
Milk							
Egg							
Cheese							
Droppings							
Others							
Total annual							

SECTION 06: OTHER SOURCES OF INCOME (2011)

	Are a member of Institutions other than MC[2]	Do you borrow in Institutions other than MC[2] or from people? 1=yes 2=no, if yes answer to the following questions		
Institutions other than MC[2]	1= yes 2= no	Amount last credit	Total amount to pay (+ interest)	Interest rates
RoSCA				
Bank				
Moneylender	------------------------			
Other MFIs				
Others				

SECTION 07: CREDIT MC[1]: This section is reserved to the treatment group

Q1	Amount of your first credit		Q9-Current cash savings(amount)	1=yes, 2=no	Amount
Q2	Amount of your last credit		RoSCA		
Q3	Total amount to repay Q3 (including interest for last credit)		MC[2]		
Q4	How long does it last Q3?		Other MFIs		
Q5	Number of time borrowered		Bank		
Q6	Total amount received		Under the matress		
Q7	Interest rate charged on credit		Confidant		
Q8	Interest rate on savings		Other		

Use of last credit and sources of repayment: Amount: …………………fcfa

Use of your last microcredit for	Amount	Use of the last microcredit	Amount	Q10-b Source of loan repayment	1=yes 2=no	Amount
1. main activity		11. to assist someboby else		Activity		
2. new activity		12. gave it to spouse				
3. second activity		13. buy assets		Salary		
4. funerals or wedding		14. pockect money				
5. purchase food		15. others		Sale of household items		
6. payment of school fees						
7. heath care expenses		Total		Other sourses of revenue (tontine; moneylender; etc.)		
8. purchase clothses						
9. purchase of household items				Your spouse /member of household/parents/freinds…		
10. Repayment of another loan				Others …………………………		

SECTION 08: THIS SECTION IS EXCLUSIVELY RESERVED TO MARRIED WOMEN

Q1	The idea of participating in the credit program MC^2 was coming from**?** 1=self 2=someone else		
Q 2	Main factors that motivated you to join the MC^2 1= saving 2=credit 3=other		
Q3	Is the credit a source of problems in your household? 1=yes 2=no		
Q4	If yes what kind of problem?	a- The husband took the loan.	
		b- He does not pay anymore the school fees of children or other family obligations	
		c-other	
Q5	Is the credit often diverted to family needs?1 = yes 2=no		
Q6	Do you borrow for your husband?1 = yes 2=no⇒Q9		
Q7	If yes, does the husband always pay the loan back? 1 = yes ⇒Q9 2=no		
Q8	If no, what strategy do you use so that he pays the loan back? 1= complaint to other family members 1= yes 2=no 2=complaint to the competent authorities (chiefs, other…)1= yes 2=no 3= remain calm 1= yes 2=no 4=other		

Q9 Five domains of women's empowerment

A woman is defined as empowered in these five domains of women's empowerment if she achieves four of the five domains.

Domain	Indicators
Activity	Who made the decision on your activities? 1= self 2= spouse 3=self+spouse jointly
Resource	Owner of land? owner of the non-farm activity 1=yes 2=no
	Who made the decision on the use of credit? 1= self 2= spouse 3=self+spouse jointly
Revenue	Who made the decision on how to use the income generated from the activity? 1= self 2= spouse 3=self+spouse jointly
leadership	Member in economic or social groups (tontine)? 1=yes 2=no
	Speaking in public: 1=yes 2=no
Time	time to rest 1=yes 2=no time for leisure activities 1=yes 2=no

Q10 After explaining the 5 domains of women's empowerment, do you think that you are empowered? 1=yes 2=no

Justify your answer

SECTION 09: MAJOR IMPROVEMENTS

Major improvements, repairs or additions made to (your housing)	1= yes	2=no
Housing repairs/housing expansion		
Installed water		
Installed electricity		
Installed telephone		
Other, specify		
Major improvements, repairs or additions made to (your activity)		
Extension of plots/renovation of premises		
Cultivated additional substance/cash crops		
Hired more workers		
Sold in new markets		
Bought inputs in greater volume at wholesale prices		
Reduced costs with cheaper source of credit		
Developed a new activity		
Installed electricity		
Installed water		
Installed telephone		
Purchased small tools		
Purchased major equipment and machinery		
Others		

CURRICULUM VITAE

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Education

2/2012− 2016	Ph.D. Student in Agricultural Economics at the Institute of Agricultural and Nutritional Sciences at Martin- Luther-University Halle-Wittenberg, Germany Dissertation topic: "Microfinance, Women's Empowerment and Poverty Alleviation: Evidence from Cameroon"
6/2011− 1/2012	Doctoral viva (in German: *Kenntnisprüfungen / Rigorosum)* at Martin-Luther-University Halle-Wittenberg
4/2010 – 4/2011	German language course in Bochum
10/2006 – 9/2007	Master in Accounting and Finance (in French: *Maîtrise*) at the University of Yaoundé II – Cameroon

Professional experience

1/ 2013	Undergraduate course: "Microfinance and development" Student supervisor with Dr. Serge Djoum at the Protestant University of Central Africa, Cameroon
9/2012 –1/2013	Primary Data collection: Impact assessment of Microfinance on small –scale farmers and non-farmers in rural Cameroon
1/2008 – 2/2010	Assistant accountant in a hardware store (Afrique Moderne Sarl) Yaoundé – Cameroon (part time job)

Conference Papers

2014	Gnilachi Nguefo, J. and Buchenrieder, G. 2014: Challenges facing rural married women after receiving microcredit: Evidence from West Cameroon. Tropentag 2014 - International Conference on "Research on Food Security, Natural Resource Management and Rural Development": "Bridging the gap between increasing knowledge and decreasing resources", September 17-19, 2014 in Prague, Czech Republic: Czech University of Life Sciences Prague.
2015	Gnilachi Nguefo, J. and Buechenrieder, G. 2015: Poverty alleviation through microfinance revisited−New evidence from a Cameroonian village bank, the Mutuelle Communautaire de Croissance (MC^2). IV. European Microfinance Research Conference, June 01-03 in Geneva, Switzerland at UNIMAIL (University of Geneva).

Workshops and seminars	
08−12 July 2013	Applied Time Series Analysis using Gretl, University of Kiel-Germany (workshop)
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10−13 Dec. 2013	Panel data analysis using Stata in Madrid (workshop)

Language	
French	Native language
English	Fluent (working language)
German	Good

Computer skills	
Tools	MS Office , SPSS, Stata

Developing Leadership	
	Founding member of „Association of Bamboutos People e.V“ in Germany
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Eidesstattliche Erklärung

Sehr geehrte Damen und Herren,
hiermit erkläre ich an Eides statt, dass ich die Arbeit selbstständig und ohne fremde Hilfe verfasst, keine anderen als die von mir angegebenen Quellen und Hilfsmittel benutzt und die den benutzten Werken wörtlich oder inhaltlich entnommenen Stellen als solche kenntlich gemacht habe. Ich erkläre darüber, dass die Angaben wahrheitsgemäß gemacht und die wissenschaftliche Arbeit an keiner anderen wissenschaftlichen Einrichtung zur Erlangung eines akademischen Grades eingereicht zu haben.

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Die Verteidigung fand am 02.05.2016 statt.

Mit freundlichen Grüßen
Josephine Nguefo Gnilachi

Abgabe von max. 10 Keywords zum Inhalt der Arbeit in deutsch und englisch in den o.g. Formaten

Mikrokredit, Armutsreduzierung, Haushaltseinkommen, Autonomie der Frauen, *Propensity Score Matching* Methode, *Difference-in-Difference Matching* Methode, *Mutuelles Communautaires de Croissance* (MC^2) und Westkamerun

Microcredit, poverty alleviation, household income, Women´s Empowerment, Propensity Score Matching method, Difference-in-Difference method, *Mutuelles Communautaires de Croissance* (MC^2), West Cameroon