The Impact of Microfinance on its Beneficiaries: Impact Assessment on Bancamia in Armenia, Colombia

A Thesis

submitted to Aalborg Univeristy

in partial fulfillment of the requirements for the

degree of

Master on Development and International Relations

By

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31st of May 2012

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List of Acronyms

AIMS	Assessing the Impact of Microcredit Services
ANOVA	Analysis of Variance
APA	American Psychologist Association
ASCRA	Accumulated Savings and Credit Association
BBVA	Banco Bilbao Vizcaya Argentaria
CIA	Central Intelligence Agency
COP	Colombian Pesos
GDP	Gross Domestic Product
FARC	Fuerzas Armadas Revolucionarias de Colombia (Revolutionary Armed Forces of Colombia)
HEPM	Household Economic Portfolio Model
HDI	Human Development Index
IA	Impact Assessment
IBD	Inter American Development Bank
LDC	Less Developed Country
MFI	Micro Finance Institution
NGO	Non Governmental Organization
PLA	Participatory Learning and Action
ROSCA	Rotating Savings and Credit Association
UN	United Nations
USA	United States of America
USAID	United States Agency for International Development
USD	United States Dollar
WWB	Women's World Banking

1 INTRODUCTION

This paper will be based on answering a straightforward question, *what is the impact of microcredits on its beneficiaries*?

In order to do this, I will present the results of a field research I did during my two months stay in the microfinance institution *Bancamia*. This Colombian based microfinance institution gave me the opportunity to work with them for two months in one of their offices, located in the Colombian city of Armenia (department of Quindío).

The paper is structured as follows. I will first review the geographical, economic and social context of Colombia and then the historical antecedents of microcredit. Next I will refer to the *on-going debate* about microfinance in the developmental field which will be followed by an introduction into a set of theories try to explain *the existence* of microfinance and *how to study* their impact on the beneficiaries. Finally, I will describe the applied methodology utilized during my field work in my research, followed by the empirical analysis and the conclusions.

1.1 A NOTE ABOUT COLOMBIA

1.1.1 *Geographical Context*

Colombia is located in northern South America, limiting with Venezuela and Panamá on the North, and with Ecuador, Perú and Panamá on the South. It has access to both Caribbean and Pacific Sea, and its landscape is varied, ranging from Andes Mountains to the Amazonian jungle and lowlands in

the coast. Its estimated land area is 1.038.700 m^2 (CIA Factbook 2012).The capital Bogotá is also the most populated city (8.262.000 hab.), followed by Medellín (3.497.000 hab.), and Cali (2.352.000 hab.)(Ibid.).

The city of Armenia is located 290 km East of Bogotá, and it is the capital of the department of Quindío. It was founded by peasants on the 14th October 1889, with the original name of Villa Holguín. Soon after its foundation in 1889 the city changed its name to Armenia Even though the common belief is that the city was renamed as Armenia in solidarity with the first chapter of Armenian genocide by the Ottomans—Hamidian Massacres of 1894–1896—, the fact that the name was changed to Armenia soon after its foundation in 1889 makes this explanation historically incongruous. The most probable explanation was that it was a fashion on that time in Colombia to name cities after the names of Biblical and Near East places (Matiossián 2003).

The most tragic date in the recent history of Armenia was an earthquake 6,2 in the Ritcher scale (USGS 2009) in 1.999 that killed about 1.000 people, and destroyed a great part of the city, leaving about 200.000 people homeless (BBC 1999). However, Armenia was quickly rebuilt, and now is referred as "Ciudad Milagro" (miracle city) due to its economic growth.

1.1.2 *Social and Economic Context*

After a four-decade long conflict with the Revolutionary Armed Forces of Colombia (FARC), the announcement in 2012 of the release of the last political hostages (Colombia Reports 2012) was seen as a huge step towards pacification. Violence has been decreasing

since 2002, but some insurgents continue to throw attacks against civilians. The total population in Colombia according to CIA Factbook (2012) is 45.239.079 (July 2012 est.), and the life expectancy at birth is 74,79 years (Ibid.).

The economic performance of the last decade has been strong, and Real GDP grew 5,7 % in 2011 and inflation ended 2011 at 3,7 %. Unemployment is still relatively high 10,8 % in 2011—arguably due to *hidden* economy—and economy is still highly dependent on oil exports (CIA 2012). *GDP per capita* is 10.100 $ (2011 est.), which ranks the 109th in the world (Ibid.). Its HDI (Human Development Index) in 2011 was 0,710 ranking 87th in the world (UNDP 2012). Its *Gini coeffient*—an index that tries to quantify inequality—was 58,5 in 2005 (Ibid.).

The city of Armenia is currently the 21st most populated city of Colombia with an estimated population of 281.013 hab. (DANE 2010). The economy is based on agricultural outputs, coffee and bananas plantation. An effort is currently being made in the whole coffee area covering the department of Quindío, Caldas and Risaralda in order to promote it as a touristic destination, stressing their mountainous landscape and traditional lifestyle and branding it as the *triángulo del café* (coffee triangle).

1.2 HISTORICAL ANTECEDENTS OF MICROCREDIT

Although there have been some precedents of this kind of activities during the history, the terms *microcredit* and *microfinance* did not start to be broadly used until the decade of 1970's. What follows is a review of what the literature has considered as historical antecedents of microfinance and a small review of its antecedents in Colombia.

1.2.1 *Historical Antecedents of Microcredit in Developing Countries*

In South Africa, Latin America and Asia, the most traditional practices that resemble microfinance are the ROSCA and the ASCRA. In ROSCA (*rotating savings and credit association*), each member of the group contributes with the same amount. Each time that the whole group gathers to collect the money, a different member of the group takes all the money. This happens usually every month. The ASCRA (*accumulated savings and credit association*) usually has a higher number of members than ROSCA. The members make periodical contributions for a determined period of time—usually a year—and after that the money is redistributed. The ASCRA may also make loans with interest to people outside the group during the year, making the funds grow even more. Their operative is somehow like a credit cooperative, but with the difference that while cooperatives encourage permanency, in ASCRA and ROSCA permanency is not encouraged beyond each cycle (Bouman pp. 374-6: 1995).

In Asia, around 1880, the government of Madras (South of India), under Britannic administration, established a credit cooperative programme inspired in German *raiffesenists cooperatives*. By 1912 there were 40.000 cooperatives and by 1946 more than 9 million. In the following years, this cooperatives lost strength, but the notion of *group-lending* remained, and can be somewhat considered the seed of *Grameen Bank* (Morduch pp. 1573-74:1999).

Later, in 50's and 60's there was an attempt to make credit institutions in many poor countries. Their objectives were to give poor people an alternative to the *moneylenders*, but they had great losses or they were just sustained by big amounts of external donors (Adams and Von Pischke p. 8: 1992). By 1975 the World Bank did an analysis on its *Agricultural Sector Policy Paper*, concluding that more than a half of the 44 institutions analysed had a failure ratio of 50% (World Bank 1975).

Reasons of failure were several, first of all the estimations of the investment returns did not take in consideration the possibility of bad harvests or other unexpected circumstances. Interest rates were too low, so there was little interest in giving small

credits. As they were subsidized, there was the perception that it was a *donation from the government*. On the other hand, borrowers did not use the money in productive activities or sometimes they invested in non-profitable activities (Adams and Von Pischke p. 9: 1992).

1.2.2 *Historical Antecedents of Microcredit in Europe*

Now I will review the antecedents of microcredit in Ireland and other European countries, based on the analysis of Hollis and Sweetman (1998a and 1998b).

From 1720's and until 1950's in Ireland there was a network of small banks with the aim to give credit to the poor, having its peak during 19th century, when it reached 20% of homes in the country.

One of the precursors of microcredit practices in Ireland was the writer Jonathan Swift—famous writer of *Gulliver's Travel*—who in the beginning of the 18th century established a fund of 500 pounds for lending to poor people. This fund had a *shared guarantee mechanism* between borrowers, as each lender had to present the reference of two of his neighbours.

Later in 1747, the *Musical Society of Dublin* made a fund with the profit from their concerts applying the so-called *Swift system*.

Due to the famine of 1822 a British committee raised an *aid donor's fund*, donating up to 300.000 pounds. There was a remainder of 55.000 at the end of the famine, so an aid a fund was established. By 1823 the fund was authorised to earn a small interest rate, exempted of some taxing—the *stamp tax*—that standard lenders had to pay. As they grew, these funds started to operate almost as banks.

From 1840 this activity begun to decline, the reason is that population become more urban based, so the funds lost the comparative advantage they had (first-hand information about borrowers in *rural environments*).

In other European countries there are also references. In England in the 15th century the Loan Beneficial Societies provided a kind of microfinancial service, based in that each

borrower had to find two *cosignatories* in order to get the credit. With the time it becomes more and more difficult to have *cosignatories*, so these societies decreased.

But maybe the long-lasting credit cooperative experience in the world can be found in Germany. At the beginning of the 20th century, the *raiffesenists credit cooperatives* accounted more than 14.500 cooperatives and 1.400.000 members. Their members contributed funds and earned low interests, being the profits destined to expand capital and sometimes to social projects. Under this system, borrowers should contribute two *cosignatories* in order to get the credit. There was a high refund rate, due to the high awareness between members—as most of them knew each other's.

Also in Italy the rural saving banks were inspired by *raiffesenists credit cooperatives*. They took place in small villages having from 20 to 60 members. Each member had right to vote, and sometimes even the obligation.

Finally in Spain their historical antecedents go back to the *Montes de Piedad/Arcas de Limosna*, created in the middle ages by the Franciscan monks. These were essentially loans with pledge for poor people. There was no interest rate, and in the case of failure the amount was recovered with the pledge. Funds came from donations, deposits—with no interests, but *spiritual rewards*—and profits. After the council of Letrán (1515), it was allowed a small interest rate. Earlier in 1480, the town council of Gollano in Navarra approved the first *Arca de Misericordia*. They were essentially loans in species—usually grain —guaranteed with a pledge (Gutiérrez-Nieto 2005).

There was another agricultural lending procedure, the *Pósito* (grain warehouse managed by the town hall where peasants could draw grain when scarcity). Later it evolved into *lending money with interests*, thus losing their initial function. The decadence of these institutions did not come until the 19th century, and mainly because of its growing insolvency, the civil administrations took too much money from them, making them insolvents. (Gutiérrez-Nieto 2005)

1.2.3 *The Emergence of Modern Microfinance*

The modern resurgence of microfinance—while even the word *microfinance* had not yet been coined—begun in early 70's, when scholars from several backgrounds—agriculture, anthropology, banking, business, economics, government service, law, public policy, religion, social work—started to learn about the dynamics of local financial markets in development countries (Robinson p. xxx: 2001).

As stated before, the first efforts made in 50's and 60's by bankers, international donors and policy-makers did not yield the expected results. But at the same time, some donor-funded NGO's were starting to identify a demand for microcredit in developing countries, and "to develop methodologies for delivering and recovering small loans, and to begin credit programs for the poor" (Robinson p. xxxi: 2001).

One of the first *modern* microfinance institutions started in 1970, as *Bank Dagang Bali* opened in Bali (Indonesia). Later in 1976, Muhammad Yunus made a first *experimental* loan of 1,5 $ to 43 poor people in the village of Jobra in Bangladesh. This loan was made without collateral and interest rate, and with the aim to let this people have a small capital. With this small amount of capital, they could pay in advance and get far better prices both for buying and selling. This was the seed of one of the world's best-known microfinance institution until now, *Grameen Bank*. (Robinson p. xxx: 2001).

The *microfinance revolution*—as labelled by Robinson—then developed in the 80's and in the 90's, when it "combined with a commercial approach to financial intermediation for low income people, making financially sustainable formal sector microfinance possible", being the pioneers of this approach *Bancosol* in Bolivia and *Bank Rakyat Indonesia* (Robinson 2001).

1.2.4 *Microfinance in Colombia*

In the 1950's and 60's, the main credit supplier to the *poor* population in Colombia were *public institutions of rural credit* like *Caja Agraria*. But problems like paternalism and corruption caused these institutions not to effectively reach the *poor* and later were abandoned due to lack of *self-sustainability* and political support (Barona 2004). The first MFI's in Colombia date back to the 80's, being 18 years the average age of the operating institutions at the end of 2008 (Martínez 2009).

One of the pioneering initiatives was the *Programa de Crédito a la Microempresa*, promoted by the *Inter-American Development Bank* (IBD). This programme initially started just with the partnership of one NGO—*Fundación Carvajal*—but in 1984 there were already 8 institutions ascribed to this initiative. Another important effort was the creation of the *Departamento Nacional de Planificación*, a public institution with the purpose of giving continuity to the microcredit policies (Barona 2004).

While I found no reliable data in the literature concerning the performance of the MFI's in 90's and early 2000's, from 2005 and on I will take the summary from Presbitero and Rabelloti (2012). In 2005 the *Inter-American Development Bank* reported that in Colombia there were 22 MFI's, serving more than 600.000 borrowers—being the main operator the *Fundación WWB Cali*, with almost 130.000 customers. At the end of 2010 *MIX Market*, reported a total amount of 34 MFI's in Colombia with about 2,1 mill. borrowers—being the largest institution the *Banco Caja Social Colombia* with almost 620.000 active borrowers and a gross loan portfolio of USD 2.400 mill. According to a study by *Vision Económica*—a local business research group—microcredit in Colombia grew at a rate of 15 % each year between 2007 and 2010, when the total amount of microloans reached more than USD 4.100 mill. (Presbitero and Rabelloti p. 5: 2012)

The latest data according to MIX *Market* is that the number of microloans in 2011 just grew a 2,5 % with respect to 2010, being a total of USD 4.200 mill. and that the number of MFI's grew to 36—being the largest ones *Banco Caja Social Colombia, Bancamia* and *Banco*

WWB, each one with a gross loan portfolio of USD 3.312 mill, USD 502 mill. and USD 352 mill. (MIX Market 2012)

With respect to the literature concerning microfinance analyses in Colombia, I can just cite the already mentioned by Presbitero and Rabelloti (2012), where the research is focused in the influence of geographical distance in microfinance repayment and a case study about *Fundación WWB* in Cali (Huertas 2007) that is focused on the macroeconomic data from this institution.

Bancamia. Bancamia was founded in 2007, when the *WWB Foundation* in Colombia and Cali joined efforts with *BBVA Foundation* from Spain in order to create a MFI that could adapt to the constant grow in demand of credit services for the *microentrepeneurs*. After fulfilling all technical requirements, Bancamia opened its first branch 18th October 2008. In its last press report on May 11th 2012, Bancamia reported having more than 500.000 customers, giving an average of 1.203 credits a day and with 161 branches all around Colombia (Bancamia 2012a), reporting profits of 16.110 mill COP (Colombian Pesos) in 2010 and 36.103 COP in 2011 (Bancamia 2012b).

2 THEORETICAL FRAMEWORK

Microfinance popularity has increasingly been growing in last two decades, and the topic has recently reached the public opinion. One of the facts that drew more attention from the global audience was in 2006 when Mohammed Yunnus and the *Grameen Bank* were awarded with the *Nobel Peace Prize* due to "their efforts to create economic and social development from below" (Nobel Prize 2006). But at the same time, critics to microfinance also started to reach the public through the media (Bunting 2010). In many cases these criticisms were targeting *Grameen Bank* with the argument that microcredits did not really help the poor—but on the contrary, they could make poor people fall into a spiral of *over-indebtedness* (Bajaj 2011)—and even portraying cases where physical threat was used in order to make the borrowers to pay (Malik 2010). Even an accusation of *Grameen Bank* diverting funds from Norwegian cooperation reached the media (BBC 2010) and had to be refuted by the *Norwegian Ministry of Foreign Affairs* (NORAD 2010)

Meanwhile, microfinance has become one of the most important tools of development policies. According to the UN, and as stated in the UN *Millennium Summit* in September 2000, microfinance should be a key strategy to achieve the *Millenium Development Goals*. In order to support this thesis, some authors give examples where microfinance has been empirically proved to eradicate poverty, promote children education, improve health for women and children, empowering women and targeting the *poorest* (Morduch *et al.* 2003). On the other hand, other authors prevent that MFI's does not always target *the poor and the poorest* but they often target *less poor customers* (Hulme 2000a)

2.1 WHY MICROFINANCE?

"Lack of access to credit is generally seen as one of the main reasons why many people in developing economies remain poor" (Hermes and Lensink 2007).

2.1.1 *Definition of Microcredit*

Even today the discussion about *what defines a microcredit* is still going on. Some definitions point to their *lending mechanisms* as one of its most characteristic features, "group lending is not the only mechanism that differentiates microfinance contracts from standard loan contracts. The programs [...] also use dynamic incentives, regular repayment schedules, and collateral substitutes to help maintain high repayment rates" (Morduch p. 11: 1999). Other definitions, like the one agreed during the *Microfinance Summit* in 1997 put the stress into *poorness* and *self-employment*, as microcredits are defined as "programmes extend small loans to very poor people for self-employment projects that generate income, allowing them to care for themselves and their families" (Srinivas, 1997).

Even though, a universal definition would hardly fit the diversity of microfinance practices all around the world, from the *western* to the *less developed countries*. An example in Europe is the recently approved *European Code of Good Conduct for Microcredit Provision* (European Commission 2011), that for example has defined its scope as "primarily designed to cover non-bank microcredit providers which provide loans of up to 25.000 € to micro-entrepreneurs" (European Commission p.10: 2011). But other definitions not so bounded geographically already defined the maximum amount of a microcredit in no more than 1.000 $ (Microfinance Bulletin p.6: 1997).

2.1.2 *Formal vs. Informal Sector*

Given the multiplicity of definitions of microcredit, in this paper I am going to depart from the notion that microcredit is one tool in order to give *the poor* an alternative to the *informal sector*. This is almost universally accepted as being one of the main objectives of microfinance (Morduch 1999; Gutiérrez-Nieto *et al.* 2004; Helms 2006; Morvant-Roux 2009). The existence of microfinance is often justified as a way to give an alternative to people that are excluded from the *traditional banking* sector and just have the *informal* sector in order to attend their financial necessities. The differences between both *formal* and *informal* sector are often blurry, and they might be characterised as a *continuum* ranging from "moneylenders, community savings clubs, deposit collectors and agricultural input providers traders and processors" (Helms p. 35: 2006) in one side to private and public banks in the other. In the middle of the spectrum there are "member-owned institutions, NGO's and nonbank financial institutions" (Ibid.).

Researchers studying the profile of microcredit customers have described them as being from *moderately poor* and *vulnerable non-poor* households—that is being more or less above and below the *poverty level*—and also with some customers from *extreme-poor* households (Helms p. 20: 2006). While some programs explicitly targeting poorer segments of the population generally have a greater percentage of clients from *extreme-poor* households, *destitute* households are outside the reach of microfinance programs (Helms p. 20: 2006).

I will first review the approaches that have been used to explain the interactions between the *formal* and *informal* forms of credit. There are two theoretical approaches that explain the coexistence of both financial sectors, one is the *residual* approach and the other one is defined as the approach "whereby the most effective cost of borrowing is thought to be used" (Boucher *et al.* 2007 as in Morvant-Roux 2009).

In the first one—the *residual* approach—the *informal* sector has a residual role, as it just receives the applications that the *formal* sector was not able to fulfil—the so-called *spillover demand* (Conning 1999 as in Morvant-Roux 2009). This approach explains the existence of *informal* credit markets either as consequence of a monopolistic position—when the *informal* market is the only source of credit available—or as a part of a perfect credit market with perfect competition—when they coexist with *formal* forms or credit (Hoff

and Stiglitz 1990). This assumptions of complete markets and perfect information, "if questionable in more developed economies, are clearly irrelevant in LDC's" (Stiglitz p. 257: 1986), that is, where most of the microfinance activity takes part.

On the other hand, the second approach takes the coexistence of the *informal* and *formal* sectors as a result of a rational decision of the borrower. This approach, in opposition of the *residual* approach, is based in the *imperfect information* paradigm, which stresses the importance of the *asymmetries of information*, that is, when the borrower and the lender have access to different (asymmetric) amounts of information in order to evaluate the risk of each transaction (Hoff and Stiglitz, 1990).

Under this approach, the borrower evaluates both *formal* and *informal* alternatives in terms of cost of borrowing (related to interests, collateral, transaction costs, etc.) and risk evaluation (related to for example the risks of undertaking a formal contract). If these prove to be weaker in the *informal* sector, this is where the borrower will first apply (Morvant-Roux p. 13: 2009). In order to overcome *information asymmetries*, moneylenders in the *informal* sector will sometimes resort to the use of enforcement mechanisms, like for example the use of interlinkages with other markets—e.g., when the moneylender takes also the role of supplier in a rural environment—or kinship and/or geographical ties. These enforcement mechanisms could determine which credits will have preference to be paid by a borrower with both credits in the *formal* and *informal* market—that is, which credits are treated as *senior debt* and which are treated as *junior debt* (Hoff and Stiglitz, 1990).In this paper I will take this second approach, which is based on the *imperfect information* paradigm.

2.1.3 *The Imperfect Information Paradigm*

This paradigm departs from the assumption that there are differences in the information available between both sides (borrower and lender), so an analysis should take in consideration these differences and to explicitly state the point of view taken. This idea was first developed by George Akerlof in the article "The Markets for Lemons" (1970),

where he described the difference of information between buyers and sellers in the American used cars market and in the insurance market. It was later developed by Joseph Stiglitz, who first applied it in order to explain the functioning of credit markets (Stiglitz and Weiss 1981), and later used this model in order to explain the success of some microfinance institutions in order to discriminate between *low-risk* and *high-risk* customers (Stiglitz 1990).

This approach finds unrealistic the assumption of a world with perfect and costless information where the bank would stipulate precisely all the actions which the borrower could undertake—and which might affect the return to the loan (Stiglitz and Weiss pp. 393-394: 1981). As opposed to that, under the *imperfect information* paradigm, "the bank is not able to directly control all the actions of the borrower; therefore, it will formulate the terms of the loan contract in a manner designed to induce the borrower to take actions which are in the interest of the bank, as well as to attract low risk borrowers" (Ibid.).

Behind the *imperfect information* paradigm lays the *theory of asymmetric information*. This theory is based in the fact that information is different to any other *commodity*, as each piece of information has to be new to the receptor in order to be valuable. So markets of information are characterized by imperfections of information about what is being purchased (Stiglitz 2000). This is related with the problems of *moral hazard* and *adverse selection*.

Moral hazard is related to a hidden action—an action (or omission) that is hidden for one of the parts of the economic relation—and occurs when the party insulated from risk behaves differently than it would behave if it were fully exposed to the risk. In banking, this would happen if, for example, the lender does not use the money of the credit in a productive and that worsens the probabilities of paying it back. *Adverse selection* is a market process in which as a result of the *asymmetric information*—that is, both parts of the transaction having different information—the *bad* product or customer is more likely to be selected. In banking this would mean that for example with a too high interest rate a bank would only attract the riskier projects.

The problem of *adverse selection* can be overcome by *self-selection*, meaning this "the process by which individuals reveal information about themselves through the choices that

they make" (Stiglitz p. 1450: 2000). The problem of moral hazard is, overcome with *monitoring* or *screening* and with the use of *incentives* (Stiglitz p. 1454: 2000).

2.1.3.1 *The Imperfect Information Paradigm: Joint Liability vs. Individual Liability*

One of the characteristics of microfinance is creation of mechanisms in order to overcome the *asymmetries of information*.

One of the most studied is *joint liability group lending,* that uses groups of borrowers instead of individuals to give the credit. If one of the members of a group fails to pay back, the rest of the members have to contribute in order to ensure the full repayment. *Joint liability group lending* "stimulates *screening, monitoring* and *enforcement* of contracts among borrowers, reducing or erasing the agency costs of the lender" (Hermes and Lensink 2007), due to *social ties* and *geographical proximity*. This is also supported by theoretical models by Stiglitz (1990), Banerjee *et al.* (1994 as in Hermes and Lensink 2007), or Armendáriz de Aghion (1999), and by several empirical studies as shown in Hermes and Lensik (2007). Another mechanism that works under *group lending* is the creation of *social capital* and *social ties* between the customers, as shown in Cassar *et al.* (2007).

But in recent years, *individual liability* is having a growing importance as many MFI's are shifting or taking this mechanism in account (Giné and Karlan p. 5: 2010). With this method, *moral hazard* would be avoided with the use of *reputation* (Stiglitz 2000), and the use of *incentives* like the progressive access to larger amounts of credit, as "new borrowers are provided small loans and allowed to increase loan sizes by demonstrating prompt repayment" (Robinson 2001). Also, some of the drawbacks of *group lending joint liability*—like tensions within the group, *free rider* problem, higher costs for better customers or lack of adaptability to demand—would be overcome with this method (Giné and Karlan pp. 5-6: 2010).

As a summary, under the *imperfect information* paradigm, the lending activity entails five components: "(a) the exchange of consumption today for consumption in a later period, (b) insurance against default risk, (c)information acquisition regarding the

characteristics of loan applicants (this is the *screening* problem) (d) measures to ensure that borrowers take those actions that make repayment most likely (this is the *incentives* problem); and (e) *enforcement* actions to increase the likelihood of repayment by borrowers who are able to do so" (Hoff and Stiglitz p. 37: 1990).

2.2 CONCEPTUAL FRAMEWORK

So far I have argued that in this study I consider microcredits as an alternative to the *informal* sector—while coexisting with it at the same time—in a non-perfect credit market characterized by the existence of *asymmetries of information*. I will now review the theoretical basis of the different methodologies for the impact assessment (IA) of microfinance.

Before deciding which methodological approach a microfinance IA wants to adopt, the researcher has to face with the choice of a *conceptual framework*. This choice is sometimes explicitly stated (Khandker 1998; Sebstad, Neill, Barnes and Chen 1995; Schuler and Hashemi 1994 as in Hulme p. 82: 2000b), but in many microfinance IA's is just implicitly taken for granted.

I will start by explaining the three main elements of a *conceptual framework* according to Hulme (p. 82: 2000b):

"—a model of the impact chain that the study is to examine,

—the specification of the unit(s), or levels, at which impacts are assessed, and

—the specification of the types of impact that are to be assessed."

2.2.1 *The Impact Chain*

The model of *impact chain* is depicted in figure 1. The *impact chain* consists in a programme that modifies the behaviour of an agent (beneficiary) and modifies the outcome of the

beneficiary and/or other agents. But we have to take care with this explanation, as it can just be taken a simplification in order to explain *how the model works*.

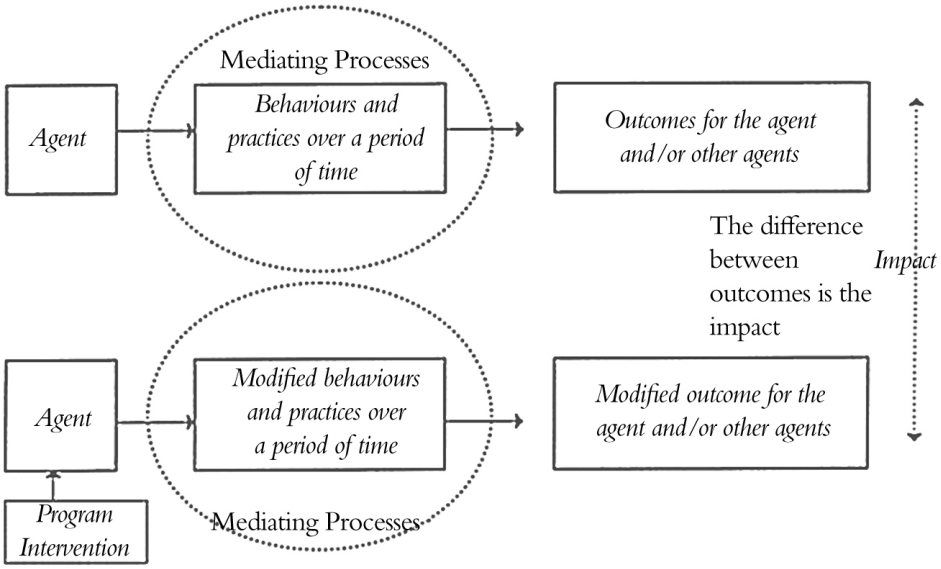


Figure 1. *The conventional model of the impact chain*
Source: Hulme p. 82: 2000b (emphasis added)

Reality is often more complex, as in many cases an effect may at the same time becomes a cause, "a more detailed conceptualization would present a complex set of links as each *effect* becomes a *cause* in its own right generating further effects" (Hulme p. 82: 2000b). One of the main difficulties when establishing an impact chain is *endogeneity*. This problem "occurs when changes in the explanatory (independent) variables are caused in part by the dependent variable" (Gaile and Foster p. 17: 1996).

Under this model, a microfinance IA measures "the difference in the values of key variables between the outcomes on *agents* (individuals, enterprises, households, populations, policymakers, etc.) which have experienced an intervention against the values of those variables that would have occurred had there been no intervention" (Hulme p. 82: 2000b).

The other main difficulty when analysing an *impact chain* is the fact that an agent cannot *experience* and *not experience* the same intervention at the same time. This is one of

the main methodological difficulties that any impact analysis has to overcome, as we will see later in this research.

2.2.2 *Units of Assessment*

Once the chain of impact has been designed, the next step in a microfinance IA is the choice of the *units* (*levels*) of assessment that the research will take in consideration. The literature has reviewed impact assessment from several different focuses, ranging from the *individual* level (e.g., Goetz and Sen Gupta 1996 and Peace and 1994 as in Hulme p. 82: 2000b) to a combination of several levels, like in the *Household Economic Portfolio Model* (Chen and Dunn 1996).

A summary of the advantages and disadvantages of each *unit of assessment* is made in table 2, taken from Hulme (p. 83: 2000b).

TABLE 2 —UNITS OF ASSESSMENT AND THEIR ADVANTAGES AND DISADVANTAGES

UNIT	ADVANTAGES	DISADVANTAGES
Individual	—Easily defined and identified	—Most interventions have impacts beyond the individual —Difficulties of disaggregating group impacts and impacts on relations
Enterprise	—Availability of analytical tools (profitability, return on investment, etc)	—Definition and identification is difficult in microenterprises —Much microfinance is used for other enterprises and/or consumption —Links between enterprise performance and livelihoods need careful validation
Household	—Relatively easily defined and identified —Permits an appreciation of livelihood impacts —Permits an appreciation of interlinkages of different enterprises and consumption	—Sometimes exact membership difficult to gauge —The assumption that what is good for a household in aggregate is good for all of its members individually is often invalid
Community	—Permits major externalities of interventions to be captured	—Quantitative data is difficult to gather —Definition of its boundary is arbitrary
Institutional	—Availability of data impacts —Availability of analytical tools (profitability, SDIs, transaction costs)	—How valid are inferences about the outcomes produced by institutional activity?
Household economic portfolio, (i.e. household, enterprise, individual and community)	—Comprehensive coverage of impacts —Appreciation of linkages between different units	—Complexity —High costs —Demands sophisticated analytical skills —Time consuming

Source: Hulme (p. 82: 2000b)

Focusing on the disadvantages, all of the *pure* approaches have some conceptual drawbacks that could limit or even discredit the validity of the analysis, while the *Household Economic Portfolio* can be seen as a mixture of all the approaches trying to overcome their limitations. On the other hand, the *Household Economic Portfolio* demands more resources in order to implement it. This can have the side effect that impact analysis with limited resources may risk "sacrificing depth for breadth of coverage of possible impacts" (Hulme p. 82: 2000b).

2.2.3 *Types of Impact*

In each of the units analysed, the choice of variables that can be used to assess impact is almost infinite. But in order to be useful, these variables must be "able to be defined with precision and must be measurable" (Hulme p. 83: 2000b). Some of the most used variables in the literature are economical—like *income*, *level of assets or debt*—but the use of social or gender perspectives in the impact analysis has broadened the choice of variables (Hulme p. 83: 2000b).

A comprehensive list of variables used in impact analysis, covering variables relating to *Education, Household, Assets/Wealth, Land, Program, Credit/Loan Information, Participation, Village Attributes, Income, Gender, Labour, Enterprise, Consumption* and *Impact* can be found in Gaille and Foster (Annex 1: 1996).

2.3 APPLICATION OF THE CONCEPTUAL FRAMEWORK

Some of the most widely used criteria when trying to measure the success of a microfinance programme are: "the client households' increased overall well-being; or clients' business success; or the community's improvement; or the program's financial viability (e.g., payback/default rates)" (Gaile and Foster p. 3: 1996).

As I have pointed before, in order to choose the criteria for a microfinance IA, first I have to choose which point of view to take in it regarding the *chain of impact*. Given the complexity of characterising an impact chain, and the difficulty in order to "separate project and non-project influences" (Mosley p. 3: 1997), Hulme characterization of two different schools of thought in microfinance evaluation is based "with regard to which link(s) in the chain to focus on" (Hulme p. 82: 2000b). *Intermediary* school focuses in the beginning of the impact chain—that is, in the *lender side*—while *intended beneficiary* school tries to go as down of the impact chain as possible—that is, focusing in the *borrower side*.

2.3.1 *The Intermediary School*

The first approach—the *intermediary* school—is taken from the perspective of the borrower/borrowing institution. The roots of this approach go back to the Ohio State University School analyses of rural finance, focusing mainly on two variables: the *institutional outreach* and the *institutional sustainability* of the programme.

According to this school, if these two impacts have taken place, an intervention is judged as beneficial. "This is based on the assumption that such institutional impacts extend the choices of people looking for credit and savings services and that this extension of choice ultimately leads to improved microenterprise performance and household economic security" (Hulme p. 82: 2000b). Although this assumption can be supported by some theoretical models, it requires further assumptions regarding perfect competition

which falls outside of the *imperfect information* paradigm—and it has been empirically proved invalid in a number of experiences (Ibid.).

The duality between *institutional outreach* and *institutional sustainability* also gives rise to two different—and in some way opposed—approaches in the microfinance world, labelling them as the *financial systems* approach and the *poverty lending* approach (Robinson 2001). Even though both approaches agree in the same goal—to serve as many poor people as possible—, they differ in the means that should be used to reach it (Hermes and Lensink 2007). While the *financial systems* approach puts the stress in the financial sustainability of microfinance programs, the *poverty lending* approach stresses the importance of using credit—even with subsidised rates—in order to overcome poverty.

It should be noted however the relevance of the *financial systems* approach in the analysis of the viability of the MFI's with economic criteria, especially their viability and/or their self-sustainability (Morduch 1999, Gutiérrez-Nieto *et al.* 2004, Gutiérrez Nieto *et al.* 2011). Questions arising in this approach are if a MFI should aim to be run without subsidies even at the expense of raising the interests up to 40%, or if microfinance programmes justify their subsidies when reaching the *outreached* (Morduch p. 3: 1999). This is related as well with the ongoing discussion in development studies about if donors should aim to the self-sustainability of the agents, regardless of considerations about if it is possible to reach the poorest and be self-sustainable at the same time.

2.3.2 *The Intended Beneficiary School*

The alternative point of view to the *intermediary* school is concerned with the analysis of the impact of microcredit programmes in the life of their beneficiaries, that is, from the point of view of the *borrower*. This focus, is the *intended beneficiary* school that "building on the ideas of conventional evaluation, seeks to get as far down the impact chain as is feasible (in terms of budgets and techniques) and to assess the impact on intended beneficiaries (individuals or households)" (Hulme p. 82: 2000b).

When taking this approach although and trying to focus "as down in the chain as feasible "(Ibid.), the choice of a unit of assessment will determine the conceptual model used. This shall be made taking in consideration the results that the impact evaluation wants to reach, but also the restrictions of the researcher (physical, monetary, etc.)

Given the previously stated focus in the *imperfect information* paradigm, and as the *intermediary* school approach departs from some assumptions unsupported by this paradigm, in this research I am taking the point of view of the *intended beneficiary* school. This means that the research focuses in the end of the impact chain, that is, in the—positive or negative—impact of the microcredit programme to the beneficiary. This focus makes less a *priori* suppositions about the impact chain and it is generally better in determining the *who* and *how*, although more demanding both methodologically and in costs (Hulme p. 82: 2000b).

So after choosing the level of the chain of impact I am going to focus on, the next step will be choosing the *units/levels of assessment* that the research is going to take in consideration.

2.4 MODEL OF THE IMPACT ANALYSIS

As previously exposed in Figure 1—when talking about the *pure* approaches in relation with their *units/levels of assessment*—"a focus purely on the *individual* or the *enterprise* has such drawbacks that they could be viewed as discredited" (Hulme p. 83: 2000b). Given the conceptual advantages (it covers several *levels of assessment* and the relation between those levels), in this research I will take the approach of the *Household Economic Portfolio Model* (HEPM). This model also incorporates the role of risk, which also fits under the *imperfect information* paradigm.

In order to contextualize the HEPM I will first make a review of its antecedents and then I will speak about its main features and applications.

When analysing the antecedents of the HEPM, the two major developments through the evolution of household models are the integration of the *production* and *consumption*

models and the disaggregation of the household in order to "reveal the role of individual preferences, resources, and bargaining power in intrahousehold decision making" (Chen and Dunn p. 12: 1996).

In order to present that development, I am going to make a historical review of different economic theories and the units of analysis—in analogy of the *units of assessment* —that they have used. For that I will follow the schema described in *Household Economic Portfolios* (Chen and Dunn 1996). First I will review the different definitions of household and its relations with other levels, and then I will introduce different economic models and theories of *household decision making*.

The first criteria in order to classify the models will be whether they take in account or not *bargaining power* and *decision making* into the household. According to this criterion will differentiate between models dealing with *household level* analysis, and then the ones dealing with *intrahousehold* analysis. Another criterion used will be the internal division within the household made in some economic models. While some of the models distinguish between the *commodity* and *non-commodity* sector (that is, between the production of market and consumption goods), others make an internal gender-based division in the household—that is, they divide the household in male and female. Both divisions may even interact in some models. The last criterion used will be *resource allocation*, where it is distinguished between *pooled* and *non-pooled* models.

Finally I will also review how different how different models/theories have approached the role of risk.

2.4.1 *Definition of Household*

The definition of household has been approached by several social sciences. Anthropology has centred its view in the relationship between household and family, while economy has centred its analysis in defining the household in relation with production and consumption. In both disciplines, feminist scholars have also looked at it focusing in a gender approach, that is, in the relation between men and women (Chen and Dunn, p. 3: 1996).

The interaction of these three points of view has produced three main developments in the definition of the household. The first one, influenced by feminist perspective that has conceptualized households "as the site of women's oppression and as the locus of conflicts of interest between women and men" (Moore 1994 as in Chen and Dunn, p. 3: 1996). This marked a shift from models that implicitly assumed altruism and cooperation in any case to models that "include the possibility of negotiation, bargaining, and (even) conflict" (Chen and Dunn, p. 13: 1996).

The second development is influenced by the anthropologist perspective where the concept and structure of the household "both produce and are produced by larger-scale cultural, economic and political processes" (Moore 1994 as in Chen and Dunn, p. 3: 1996). This approach has caused "a shift from the analysis of the household as a bounded unit towards a view which stresses its permeability" (Ibid.).

The third development, also highly influenced by the *anthropologist* approach, has been the recognition of the variability of the household between different societies or even into the same society. This has yielded a definition of household as "a family or kinship unit (e.g., the conjugal family) or as those who share a common residence or as those who share a joint function such as consumption, production, investment or ownership" (Chen and Dunn, p. 3: 1996). It should be taken in consideration that the three elements of this definition may or may not coincide at the same time.

2.4.2 *Household Level Analysis*

Two main characteristics will differ in these models. First, the way they treat *consumption* and *production function*, and then their assumptions about the relations between the household and credit, labour and land market (perfect or imperfect competition and/or information).

Neoclassic theory takes two units of analysis, consumers and firms. The consumer can be either an individual or a household. However in this theory both units are treated independently. So when analysing the *theory of consumption*, the household or individual is the subject of analysis, and tries to maximize its utility finding the optimal combination of

goods and leisure. The idea that the household or individual have a utility function and the assumption that they try to maximize it are the basis of this theory.

But when analysing the *theory of production*, the firm is the only subject of analysis, and it tries to optimize the production function, that is the combination between inputs and outputs, in order to maximize its profit. Some key assumptions are that the availability of inputs as well as the amount of outputs the firm can sell are considered unlimited. So in order to explain the economic behaviour of individuals or household, "neoclassical consumer theory lacks an explicit linkage to the household's production activities" (Chen and Dunn, p. 13: 1996). In the core of the model is also the existence of complete markets and perfect information.

A model that tries to combine both elements of the *neoclassic* theory—both consumption and production—and introduces the division between *commodity* and *non-commodity* work is the *Chayanov* model. This model was developed by Alexander Chayanov in 1923 in order to study the economy of peasant households in Russia (Harrison 1975).

Under this model, "the household seeks to maximize its utility, where utility is derived from the consumption of goods produced on the farm, purchased goods, and leisure" (Chen and Dunn, p. 14: 1996). This model provides a link between production and consumption theory, as it combines utility maximization and the production function. The main assumptions of this model are that "the household does not have access to wage labour, and that the household has unlimited access to land" (Chen and Dunn, p. 14: 1996).

Another model that departs from the *neoclassic theory of consumption* is the *new home economic* model, proposed by Becker (1965) under the framework of *new home economics*. This model explicitly takes the household as the unit of its analysis, being these households "both producing units and utility maximizers" (Becker p. 495: 1965). In order to create a link between production and consumption, the model introduced the concept of the so called *Z-goods* or *Z-commodities*. These goods are created by the members of the household by combining their time and human capital with purchased goods, creating then the *Z-goods*. These goods become part of the utility function of the household, creating a link

between utility maximization and the problem of time allocation between the *commodity* and the *non-commodity* sector.

Finally, the *farm household* model was first proposed by Barnum and Squire (1979) in order to analyse agricultural households, but it is possible to apply to non-agricultural households as well. The main contribution of this models is that it distinguishes between paid (wage) work and work in an own enterprise, as well as between goods produced for consumption and for production. Under this model, the household tries to optimize time allocation between work on an own enterprise, wage work and leisure, assuming a household in complete factor, product markets and credit markets.

2.4.3 *Intrahousehold Level Analysis*

Up to now the models described make the assumption of altruism between the household, so there is just one a utility function for all the members of the household, and a *benevolent dictator* is assumed to reconcile the members' individual interests when they collide, making sure that they pursue the common interest.

In contrast with the assumptions of household models, the *intrahousehold* models "depart from the household models' assumptions of joint household utility functions and altruism and replace them with conflict, bargaining, and unequal power relationships between the husband and wife" (Chen and Dunn p. 17: 1996). This establishes a framework to introduce the division of the household between husband and wife, in order to analyse differences in "time allocation, expenditure patterns, access to resources, and enterprise choice" (Ibid.).

2.4.3.1 *Intrahousehold Level Analysis: Pooled Models*

In the *intrahousehold* analysis we can distinguish between *pooled* and *non-pooled* models. *Pooled income* models consider that husband and wife share common (pooled) resources. But instead of having a single (joint) utility function, they use separate utility functions for male and female (Manser and Brown 1980, McElroy and Horney 1981, Lundberg and Pollak 1993 as in Chen and Dunn p. 17: 1996). One of the basic assumptions is that men and women will cooperate until the utility of the marital arrangement exceed the utilities they could get outside the arrangement, being this a *fallback position*[1]. This *fallback position* can also reflect consequences of the power inside the household. "Examples of variables that affect the fall back positions include conditions in the labor market, conditions in marriage markets, rules governing property rights, laws governing divorce, and physical,

1 That is, the point from where cooperation ceases from being beneficial.

financial, and human capital assets held by the individual marriage partners" (Chen and Dunn p. 18: 1996).

2.4.3.2 *Intrahousehold Level Analysis: Non-Pooled Models*

In opposition, the *non pooled income* models keep on assuming that husband and wife have different utility function, but also separated non shared income. In the the *general collective bargaining* model (Chiappori 1992), the different members of the household have separate *labour* and *non-labour* income, but also a *share agreement*. Changes in the income of any of the members will not affect other members' utility maximization as long as it doesn't change the outcome of the *share agreement*.

The *conjugal contracts* model (Carter and Katz 1996) also incorporates the possibility of collaborating when producing *Z-goods*. Bargaining is reflected in this model by the *exit* (meaning the indirect utility the individual might gain dissolving and/or leaving the household) or *voice* (referring to the degree that both partners can influence and/or bargain in the determination of time allocation) options (Ibid.). Finally, in the *reciprocal claims* model and the *separate spheres* model the household is divided in *gender-specific economies* where both husband and wife may cooperate in determining optimal levels of income transfers, but when it comes to resource allocation, they each will decide their optimal choice according to their individual resource constraints, but also taking in account partners' changes in resource allocation (Katz 1992, Lundberg and Pollak 1992 as in Chen and Dunn p. 18: 1996).

2.4.4 *Risk and Coping Response Models*

In addition to that, some models also take in consideration the role of risk in the household. Literature concerning household economic models define risk either "as the

variance in outcomes, such as variance in profits or income, or it is defined as the probability of a negative outcome (a loss)." (Chen and Dunn p. 18: 1996) If a household is in the edge of survival, its risk aversion may be higher than the one of a household with more economic security, as in the first case a negative outcome could translate with a failure to survive. The following description will take in consideration risk primarily as associated "with the source of livelihood, of income, or (simply) of food" (Ibid.), and it will distinguish between models of risk *per se* and models of responses to risk.

2.4.4.1 *Risk and Coping Response Models: Models of risk*

About risk *per se*, the most common distinction is drawn between *recurrent*—more predictable, like seasonality—and *periodic*—less predictable and more severe, like floods—(Morduch 1997), and associated with that two there are two other key dimensions, one temporal—the temporal length of the crisis[2] period—and one spatial—the geographical range of the crisis.

Taking in account the nature of these risks—mainly predictability and periodicity—households take different *precautionary* and *response strategies* (Morduch 1997). Some types of *precautionary strategies* are the diversification of income and/or livelihoods, the accumulation of assets, and the "social investments in reciprocal or redistributive systems among households" (Chen 1991; Huss-Ashmore 1988; Shipton 1990 as in Chen and Dunn p. 18: 1996), like norms concerning reciprocity and caring for vulnerable members among marriage, lineage or kinship groups (Chen and Dunn p. 20: 1996).

2.4.4.2 *Risk and Coping Response Models: Models of Coping Strategies*

The *response strategies* typically referred by household models depend on the stage of the crisis—early, middle, and late—being from low to high severity depending on the response measures involved, and some models also include also a recovery phase (Ibid.). In

2 Understood as a collective negative shock (Dercon 2002)

summary, the literature consider four important dimensions in coping strategies, that is adjustments in work, consumption assets and other social relationships, the level at which the strategy is negotiated (household, community, etc.), the degree of reversibility of the strategy and finally the sequence or timing of household strategies (Chen 1991 as in Chen and Dunn p. 20: 1996).

2.4.5 *The Household Economic Portfolio Model*

The HEPM (*household economic portfolio model*) was developed in order to assess the design of the USAID project on Assessing the Impact of Microcredit Services—AIMS (Sebstad *et al.* 1996), that is was designed specifically for microcredit IA.

This model incorporates some features from previous models, and integrates it. It includes several divisions into the household, like *commodity vs. non commodity*—market *vs.* nonmarket spheres of production—and gender-based—male *vs.* female domains of resources, activities, and power, as well as other socially defined hierarchies—(Chen and Dunn p. IX: 1996). In relation with the duality of *pooled vs. non pooled* models, the HEPM does not make any assumption about if the resources are held jointly or not. It just recognizes a wide variety of "possible intrahousehold arrangements, including pooled-to-non pooled income, joint-to-separate preferences, cooperative-to-conflictual bargaining, and joint-to-separate allocation of time and resources" (Chen and Dunn p. IX: 1996).

Its *units of assessment* are the *individual* level—"individual member of the household, and the intrahousehold dynamics between members" (Ibid.)—, the *household* as a whole at an aggregate level, and finally the *microenterprise* and the *community* level—regarding "interactions of the household, its members and the wider social and economic environment" (Chen and Dunn p. 23: 1996).

The *household economic portfolio* is then defined as "a) the set of household resources, b) the set of household activities, and c) the circular flow of interaction between household resources and household activities" (Chen and Dunn p. 23: 1996).

The typology of the resources available for the household can be *human*—like time,

labor and skills—*physical*, and *financial*. About household activities, they can take form of *consumption*, *investment* or *production activities*—being the production either wage work, income generating activities and household maintenance. The link between *activities* and *resources* is that while resources support the developing of activities, the output of these activities goes as well to the pool of resources.

However, the model does make some assumption relating *cooperation, bargaining and/or conflict* inside the household. The members of the household may have separate preferences, as well as separate resources and budget restrictions, so they may take individual as well as joint decisions and/or activities. Individuals may or may not choose to cooperate in certain situations. And finally, the strategies of the individuals reflect differences in power due to asymmetries in access to resources, and in their social roles and relationships.

2.4.5.1 *The Household Economic Portfolio Model: The Portfolio System*

The process in which the household rearranges its mix of resources, labour and activities is described as a *portfolio system*. This can be defined as "the mix of strategies, both individual and collective, developed or drawn upon by a household over a given period of time for economic and social objectives" (Chen and Dunn p. 26: 1996).

This system is based in several assumptions. First is the existence of individual—and sometimes competing—preferences between the members of the household. Second is the existence of bargaining and conflicts within the household. Third is the assumption that the members of the household may or may not cooperate in any decision. And finally that *bargaining power* reflects the access to resources.

This gives raise to several patterns of the activities of the members within the household. This is illustrated as man and woman may have separate, *parallel activities* (e.g., one in the *commodity* and the other in the *non-commodity* market), or perform *integrated activities* (e.g., joint agricultural production), or even *substitutable activities* (e.g., man withdrawing for agriculture to pursue an alternative employment, leaving all tasks for women).

Some dimensions of the portfolio system have special relevance when analysing the impact of a microcredit programme. *Gender dimension* is given a great importance, as women are considered more likely of moving between different sectors of production—*commodity* and *non-commodity*—and to have different preferences, constraints and/or resources than men. The *risk dimension* is also considered, as poorer and richer households manage risk differently and have different risk aversions. Finally, *nonmarket modes of production* like subsistence production—in agrarian communities, time spend working in the household, family labour—or subsistence activities—like time spent on food, fuel or water collection—are also considered (Chen and Dunn p. 27: 1996).

2.4.5.2 *The Household Economic Portfolio Model: Applications of the* HEPM

The typology of portfolio systems in a specific area is characterised by the HEPM in a continuum that goes from the poorest to the richest households. The poorest ones are expected to pursue short-term survival objectives, mainly through the diversification and intensification of labour activities. Apart from the objective of survival objectives, they would also save for contingencies, in order to be able to response crisis avoiding a forced sale of assets. On the contrary, richest households will be expected to pursue long term mobility through diversification of assets and investments, as well as other objectives like increased power income or status (Chen and Dunn p. 27: 1996).

Thus, the households in the middle term between the *poorest* and the *richest*, will pursue stability and security objectives, but will also try to minimize risks when looking ahead for economic and social mobility. "The calculation of trade-offs between status, risk aversion, and income or between consumption, savings, and investment would most likely be less straightforward than for those households at either end of the continuum" (Chen and Dunn p. 28: 1996). The key distinctions between all the households in these three points are according to this model, the level of income or welfare of the household, the approach to risk management and the degree of diversity of activities or strategies (Chen and Dunn p. 28: 1996).

So at this point, the HEPM identifies the households with lower levels of economic

security with those with the smaller set of resources, including fewer physical and financial resources. These households would have to support mainly through their available labour, with the implication of having less capacity to support household activities, which may imply lower consumption and fewer production and investment activities (Ibid.).

This suggests two possible indicators of the security of the household "1) the income and other additions to resources flowing from the household activities to the household resource base (a flow measure) and 2) the value of household resources (a stock measure)" (Ibid.).

About the role of credits in the households, according to the HEPM, the credit when received creates an addition in resources available. This extra resources may be allocated to just one or to all of the household activities. If the credit was received in a previous period, it will be also take resources out of the household in the form of debt repayment, but if the credit was used in production or investment activities, it may also have increased the flow of resources of the household, increasing repayment capacity. Another use of the credit would be to smooth consumption in a period when the resources of the household are low, but on the other hand this does not directly increase repayment capacity of the household. (Chen and Dunn p. 29: 1996)

Another implication of the HEPM will affect *intrahousehold behaviour*. Given the assumptions made about *cooperation, bargaining and/or conflict*, when the credit is received, the individual who controls it would determine the allocation of the extra resources between different household activities, and may choose to invest in their separate activities or in the joint activities of the household. According to HEPM, when the preferences or constraints of the members of the household are different, individuals may take irrational decisions from the household point of view, like for example investing in a less-productive enterprise than other, but over which they have control (Ibid.).

2.4.5.3 *The Household Economic Portfolio Model: Proposed Hypothesis*

As a conclusion to the model, the authors recommend three sets of hypotheses. The first group is concerned with "the impacts of microenterprise services on household income

and the portfolio of activities that generate income" (Chen and Dunn p. 33: 1996):

— H-1: Participation in microenterprise services leads to an increase in household income.

— H-2: Participation in microenterprise services leads to increased diversification in the set of production activities.

— H-3: Participation in microenterprise services leads to an increase in the reliance of the household on high-return production activities.

The second group of hypotheses are "concerned with the impacts of microenterprise services on the investments of the household [...] and focus on the set of household resources":

— H-4: Participation in microenterprise services leads to an increase in key physical assets.

— H-5: Participation in microenterprise services leads to an increase in savings.

— H-6: Participation in microenterprise services leads to an increase in expenditures on the education and training of household members.

Finally, it makes two hypotheses at the *individual level*:

— I-1: Participation in microenterprise services leads to increased control by the client over resources within the household.

— I-2: Participation in microenterprise services leads to an increase in the amount of women's time spent in self-directed employment and wage work.

2.5 STUDY DESIGN

When approaching a microcredit IA, design of the study will have to take in consideration the chosen model, the *conceptual framework* and the paradigm, but also the empirical reality that is going to be approached as well as the resource limitations of the research. I will now make a review of the different approaches when designing a microfinance IA, and

then I will point the potential biases that a microfinance impact evaluation should try to avoid.

2.5.1 *Study Design Theories*

As depicted by Hulme (p. 84: 2000b), the two main problems when facing a microfinance IA are *attribution* and *fungibility*[3]. But "at the heart of impact assessment is the attribution of specific effects (i.e., impacts) to specific causes (i.e., interventions)". When this problem is solved, it will be safe to examine the chosen links in the *chain of impact*. So the problem of *attribution* and the way to deal with it will determine the three paradigms commonly used for a microfinance IA design.

The first one is the scientific method, based in natural science. The second paradigm is rooted in the humanities tradition and more based in qualitative research than quantitative. The third paradigm, the more recent one and still developing is the Participatory Learning and Action (PLA). This paradigm is a "participatory approach to development planning" (Hulme p. 87: 2000b), that questions the scientific method as "it ignores the complexity, diversity and contingency of winning a livelihood; it reduces causality to simple unidirectional chains, rather than complex webs; it measures the irrelevant or pretends to measure the immeasurable; and, it empowers professionals, policy-makers and elites, thus reinforcing the status quo and directly retarding the achievement of development goals" (Hulme p. 87: 2000b). Thus, PLA is an attempt to empower the beneficiaries of development programmes in order to make them take the lead in problem identification and knowledge creation (Ibid.).

But even though PLA is a promising insight, I will focus in analysing the two paradigms with more academic tradition, the scientific method and the humanities paradigm.

3 The possibility that the money from a microcredit aimed to be spent in setting up a new enterprise would be used in day to day expenses.

2.5.1.1 *Study Design Theories: The Scientific Method*

The goal of the scientific method is to "ensure that effects can be attributed to causes through experimentation" (Mosley p.84: 1997). Although this approach deals particularly well with the problem of *attribution*, it also has some drawbacks, being *endogeneity* and *fungibility* two of the main difficulties that a microfinance IA has to solve under this paradigm.

Under the *intended beneficiary* school and when in the *scientific method* paradigm, there are two different approaches: *multiple regression analysis* and *control group* approach (Mosley p.84: 1997). *Multiple regression analysis* deals particularly well with the problem of *endogeneity*, but at the expense of higher costs, demand of data and the use of sophisticated econometrical techniques that are out of reach of most microfinance IA. This approach has its drawbacks, having "biases associated with regression analysis in those cases where the standard assumptions of the normal linear regression model (normally distributed disturbances, constant variance of the error term, etc.) do not hold" (Ibid). The most used approach in microcredit impact analysis is the *control group* approach, where one of the main issues in a microcredit impact research is to find a valid comparison, that is, to find a valid control group in order to compare the results of the beneficiaries to something else.

There are several designs possible in order to achieve that. The *experimental* design can be considered the most rigorous of them all. In these design, the researcher takes a random sample in a given population, makes a baseline survey and then gives them a microcredit —thus avoiding *selection bias*. A control group is set, and also surveyed. When a significant time has passed—one of the common references used is 18-24 months after—another survey is made both to control and intervention groups, and impact is measured. These kind of studies are recent in time, and some of them have not yielded conclusions yet (Banerjee *et al.* 2010, Karlan and Zimman 2010). When these steps are followed but randomization is not possible, this design is called *quasi-experimental.*

There is a wide discussion if the evaluation impact studies should focus to a strict methodology or try to adapt each MFI's circumstances with a more flexible approach, as budget and operational limits makes it often really difficult to make an experimental

design (Karlan *et al.* 2009, Cheston and Reed 1999). We should consider then other possible approaches in order to make the best research with the resources available.

The *observational* designs are divided into two main categories: *longitudinal* designs and *transversal* designs. These studies compare a group that is already receiving a microcredit with a control group. In *longitudinal* design a group of beneficiaries and a control group are compared in two or more moments of time, measuring the impact (Pitt and Khandker as in Gaile and Foster 1996)

In *transversal* design, one possibility is to do *recall questions*, in order to compare the situation of the same beneficiary in the present with the situation a certain time ago (Mustafa *et al.* 1995, Buckley as in Gaile and Foster 1996). But the most standardized and recommended *transversal* design is the *cross-sectional* approach. This approach consider incoming beneficiaries as the control group, and then compares selected variables with beneficiaries that have been more than two years in the programme (Hulme and Mosley 1996, Karlan 2001, SEEP Network 2007) in order to see if any significant change could be measured, usually by comparing the mean of both groups. This method has clear practical advantages, as the study can be made in just one moment in time, and there is no need to find a control group outside the MFI.

2.5.1.2 *Study Design Theories: The Humanities Paradigm*

The humanities approach, thought pioneered by Geography and Rural Sociology, nowadays is more influenced by Anthropology. It is characterized by an inductive approach, and a focus in key informants and in data collection. Contrary to the scientific approach, it doesn't try to statistically prove, but to make an interpretation of the processes involved in the intervention. The data generated is commonly qualitative, and the methods used to get this data involve surveys, focus groups, participant observation and field research (Hulme p. 85: 2000b).

This approach is especially useful when trying to understand "changes in social relations, the nature of programme staff-beneficiary relations and fungibility" (Hulme p.

86: 2000b). It also has the advantage that it doesn't have to deal with biases associated with scientific approach, which I am going to characterize in the next section.

But the humanities approach has severe limitations with the aforementioned *problem of attribution*. "Such studies cannot usually demonstrate the causal link as they are not able to generate a *without programme* control group" (Ibid.).

2.6 POTENTIAL BIASES

In this section I will analyse the main biases associated with the *scientific method*, focusing special attention on the biases associated with *cross-sectional* analysis, as this method is becoming one of the main standards of microfinance IA.

2.6.1. *Fungibility and Endogeneity*

One of the most recurrent problems faced by microfinance IA refers to the *fungibility* of resources between the microenterprise and the household. In the context of microfinance IA, *fungibility* is the possibility that the money from a microcredit aimed to be spent in setting up a new enterprise would be used in day to day expenses.

Even the existence of the possibility of overcoming fungibility has been discussed. Gaile and Foster wrote that "no study has successfully controlled for the fungibility of resources between the household and the assisted enterprise" (p. 24: 1996), but as the interplay between household and enterprise considered as part of the microfinance process, "rather than simply controlling for fungibility, it would be useful to study it in depth as part of the research design" (Ibid.).

But as stated by Mosley (pp. 9-10: 1997), there are methods to insure against this bias, like asking the borrower at the beginning of the programme the purpose of the microcredit and then checking it afterwards. But as several studies have proofed that some of the supposedly productive investments have revealed unproductive while some

consumption activities have revealed as productive (not only schools expenses but even expenses in food), the importance of *fungibility* should not be overestimated (Ibid).

The other big challenge to the scientific approach is the problem of *endogeneity*, that is, "when changes in the explanatory (independent) variables are caused in part by the dependent variable" (Gaile and Foster p. 17: 1996). So endogeneity will exist any time the causal link between two variables can go either way. An example of this would be the increase of education expenses that may be due to an increase of income in the household, but the other way round, more education expenses may create more job opportunities and increase household income.

Endogeneity is claimed to be overcome with the use of *two-stage least squares regression* analysis, but the data and resources requirement makes it feasible just in rare occasions like in one of the most cited microfinance IA (Pitt and Kandkher 1998). This study sampled 1.798 households in Bangladesh explicitly trying to control *endogeneity* with sophisticated econometric techniques. Even thought, their results are still contested and they have gave rise to an ongoing discussion[4] about its validity when controlling *endogeneity* (Pitt 2011a; 2011b and 1999; Morduch 1998; Roodman and Morduch 2009)

So as solutions for *endogeneity* based in statistical regression are hard to implement and heavily questioned, we will take Hulme recommendations to the respect. "For most researchers adopting the scientific method, reverse causality is a problem to be coped with rather than overcome. The main means of dealing with it are tracing dropouts from both the treated and control groups; only conducting IA's on relatively mature programs; interim impact monitoring activities to gather qualitative information about the complexity of causality; and retrospective in depth interviews with clients" (Hulme p. 85: 2000b).

4 A "summary" of the polemic between Pitt and Kankher and Roodman and Murdoch can be found here <http://blogs.cgdev.org/open_book/2011/03/response-to-pitts-response-to-roodman-and-morduchs-replication-of-etc.php>

2.6.2 *Biases Associated with Sample Design*

Selection bias will take place when the sample is not impartially designed. One the most mentioned causes of the *selection bias*—if the participation in a microcredit programme is voluntary—is the supposition than the ones who will ask for a credit will have a higher *entrepreneurial spirit*, and higher abilities to run its own company (Karlan p. 79: 2001, Gaile and Foster p. 19: 1996). So if the *control* group is chosen outside the programme, there will presumably be a difference in *entrepreneurial spirit* between the *intervention* and the *control* group.

Other possible sources of the *selection bias* will be the *programme choice*, as poor designed programs are less likely to be chosen by the researcher, and also *site selection*, as less accessible and/or dangerous places also likely to be avoided by the researcher (Gaile and Foster p. 19: 1996).

Another point to take in consideration is what Mosley defines by analogy with the *hawthorne effect* in which "factory workers who knew themselves to be the subject of an experiment exhibited systematically higher productivity than otherwise identical workers who were not singled out in this way" (Mosley p. 8: 1997)

Finally, it should be pointed out the *motivational problem*. If the control group is chosen outside the program, and it has no relationship with it, the individuals in this group will have "no incentive to cooperate with the survey. They will either refuse to respond or give biased, incomplete or misleading answers" (Mosley p. 13: 1997).

One of the strengths of *cross-sectional analysis* is that it gives a tool to overcome this three biases, as incoming beneficiaries are "presumably just as entrepreneurial, and feel just as much a sense of belonging to the microcredit experiment as those who already are using loans" (Mosley p. 8: 1997). But while giving a solution to these biases, the use of *cross-sectional* analysis is considered to create several additional biases (Karlan 2001)

2.6.3 *Biases Associated with Cross-Sectional Analysis*

The main biases created by *cross-sectional* analysis can be categorised in two groups, *drop out biases* and *timing problems* (Karlan 2001, Tedeschi and Karlan 2009).

One of the main objections to the *cross-sectional* analysis is the difficulty of dealing with *drop outs*. As the beneficiaries that left the programme (*drop outs*) are often more difficult to find and/or interview than the ones that stay. Sometimes *drop outs* are just *taken out of the picture,* assuming that the impact analysis will reach the same conclusions without taking them in consideration. "This cross-sectional approach makes many assumptions that are untested and others that are tested and false. For example, it assumes that *drop out*s have, on average, identical income and consumption levels to those who remain. Furthermore, this approach assumes that *drop outs* are not made worse off by participating in the program" (Karlan p. 78: 2001).

Drop outs could create two kinds of bias: the *incomplete sample bias*, and the *attrition bias*. The *incomplete sample bias* is the possibility that those who dropped out could have experienced a different impact. Those who left the programme might have left because of a poor performance—so the impact will then be overestimated—or it may be the cause that the most successful entrepreneurs may *graduate* from the programme—the impact would then be underestimated. The other bias associated with *drop outs*, the *attrition bias,* points out the possibility that those who dropped out could be different because of their inherent characteristics So even if the programme has no impact at all, if those who *drop out* share similar characteristics and are not interviewed, the impact may be over or underestimated (Karlan 2001, Tedeschi and Karlan 2009).

One of the mentioned strengths of *cross-sectional* analysis was that it gives a solution to the selection problem. This problem was created as those participating in the programme are thought to possess a higher *entrepreneurial* spirit. By including both groups (control and treatment) that were self-selected in the program, *cross-sectional* analysis wants to overcome this problem. But it should be explored as well the *timing problem*, that is, why people choose to participate in the programme in a particular moment of time and no other. This

point gives raise to two other potential sources of bias, the *peer selection problem* and the *time of decision problem* (Karlan p. 79-80: 2001)

The *peer selection problem* is the problem of best applicants being granted on the first years, and then the remaining worst projects the following years as the pool of projects gets empty (Hulme, Montgomery and Bhattacharya pp. 159-222: 1994). When considering this problem we will have to consider if the data of the latest borrowers is statistically different from that of the first ones.

About the *time of decision problem*, there is the possibility that individuals join the programme just after determinate events, like when everybody in their house is healthy and they don't need constant care at home. In cases like this, the cause underlying an improved welfare may not be the microfinance programme but the event that caused it (Tedeschi and Karlan p. 6: 2009

Finally, I will discuss about biases related with the *institutional dynamics* of the MFI's. First one is related with *programme placement*, as a MFI would try to start establishing in the richest neighbourhoods, and then progressively move to the poorest, or *vice versa*. In this situation, *cross-sectional* analysis comparing two groups from with different *seniority* would erroneously attribute an impact to the programme. Another bias is related with *credit requirements*, as the MFI policy may change with time thus reaching poor/less poor customers. These changes can also be related with the changing economic situation, and this can also be a source of bias.

3 METHODOLOGICAL CONSIDERATIONS

In this research, the approach is mostly based in scientific method, as the analysis is based in the empirical data that I could get during my stay in the Bancamia branch in Armenia in order to analyse the impact of microcredit schemes of Bancamia in the life of its customers. The planned survey had as well some qualitative elements, as at the beginning the plan was that most of the interviews were face to face.

But due to material and time restrictions it was decided to make only some qualitative interviews in the company of one of the Bancamia officials. This gave me the opportunity for a more informal chat in order to get their impression from the microcredit programme and their business and personal performance, as well as to see their day to day reality. Finally, in order to design the survey a panel meeting was set with all Bancamia office members in order to get their ideas and feedback about the impact analysis.

3.1 IMPACT ANALYSIS DESIGN

In order to design this research, I followed the guidelines given by the AIMS (Assessing the Impact of Microenterprise Services) Project team (Sebstad *et al.* 1995), which are based in the HEPM. These guidelines are based in the hypotheses proposed by HEPM and they will be the base to design the impact evaluation.

3.1.1 *Units of Assessment*

The *units of assessment* pictured in AIMS project are *individual, household, enterprise* and *community* levels. This levels are taken from the HEPM, which itself was designed to serve as the core for the AIMS guidelines (Chen and Dunn 1996)

In this research I will take *household* and *enterprise* levels. I will not take *community* level in account, as individuals surveyed often belong to a large urban environment as the city of Armenia and its surroundings where the concept of community is often too blurry and difficult to precise. About the *individual* level, this was supposed to be tracked by individual surveys done by the researcher that finally were not done. This decision was taken as I found more useful the alternative of being able to gather a better data for the *household* and *enterprise* level instead.

3.1.2 *Study Hypotheses*

The study will test four hypotheses taken from Sebstad *et al.* (pp. 57-58: 1996) and based in some of the hypotheses proposed in the HEPM (Chen and Dunn 1996).

At the *enterprise* level:

— H-1: Microenterprise interventions promote enterprise growth by contributing to net increases in enterprise income, net increases in employment at the enterprise level, and expanded resource base, and reinvestment of enterprise earnings in the enterprise.

And in relation with *household security* (*household* level):

— H-2: Microenterprise interventions contribute to net increases in household income by increasing microenterprise income and through reinvestment of microenterprise income in other household income-generating activities.

— H-3: Microenterprise interventions contribute to household security by generating surplus income for use in the accumulation of assets.

— H-4: Microenterprise interventions contribute to net increases in household income which leads to increased expenditures on food, education, and health, and thus economic security.

3.1.3 *Types of Impact*

In relation with the *types of impact*, I followed Sebstad *et al.* identification of *impact paths*: "for households, advancement in terms of improved economic security; for enterprise, development in terms of viability, stability and growth; for individuals, improved well-being; and for communities, economic development and civil participation" (p. 21: 1996). In order to measure changes along these paths, I followed the distinction between *domains of change* at the chosen levels—household and microenterprise—and the specific *markers of change* within those levels (Sebstad *et al.* p. 21-41: 1996).

3.1.3.1 *Types of Impact: Domains of Change*

The *domains of change* at the *household* level are: *changes in household income*—incomes from the enterprise and/or other income generating activities into the household—, *expenditures on household consumption*—considering basic expenditures and debt—, and the *variations in assets*—like savings, physical assets and human capital.

At the *enterprise level*, the domains of impact are: *resource base*—capital, labour, assets, liabilities and inputs—and *production processes*.

3.1.3.2 *Types of Impact: Markers of Change*

In relation with each one of the *domains of change*, I take in consideration the following *markers of change*:

At the *household* level, I examine the domain of *changes in household income,* labelled as *TOTAL INCOME* and disaggregated in income from *Sales, Couple, Sons, Subsidies, Rents, Interests, Salaries,* and *Others*. The variations in the domain of *expenditures on household consumption* are labelled as *FAMILY EXPENSES* and disaggregated in expenses in *Food, Education, Health, Insurances, Transportation, Supplies, Rents* and *Others*. The variations in

the domain of *variations in assets* are labelled as *Household Assets*, and disaggregated in *TV, Music System, DVD, Refrigerator, Washing Machine, Computer/Game Console, Vehicle* and *Others*.

At the *microenterprise* level I examine the changes in the domain of *resource base* labelled as *Cash and Banks, Accounts Receivable* and the *Microenterprise Assets*, being the last one disaggregated in *TV, Music System, DVD, Refrigerator, Washing Machine, Computer/Game Console, Vehicle* and *Others*. In the domain of *production processes* I examine the changes in Inventory—disaggregated in *Raw Materials, Work In Process* and *Finished Goods*—and in Microenterprise Expenses—disaggregated in *Number of Employees, Personnel Cost, Rent, Supplies, Transportation, Food, Publicity, Vigilance* and *Others*.

Liabilities belong both to *enterprise* and *household* level—in the domains of *resource base* and *variations in assets*—and are labelled as *Short Term Liabilities* and *TOTAL LIABILITIES*—disaggregated in *Suppliers, Financial Liabilities, Number* of *Credits and Others* —. The difference between both categories is that the first refers to the quantity destined each month to liability payment, while the second refers to the rest of the liabilities—that is, the principal and the interest to be paid in more than a month in advance.

All this categories are based in the ones that Bancamia uses in order to store information from the customers.

3.2 IMPLEMENTATION OF THE STUDY DESIGN

In order to make the best design for the research, it was important to check the *day-to-day reality* of Bancamia branch in Armenia. The first step was to check the information available about the beneficiaries. Two were the sources, first of all the personal files of each of the 1.998 customers of Bancamia branch in Armenia were physically stored in the office. Second, I asked the headquarters of Bancamia in Bogotá for all the information they could have available in digital format about the customers.

3.2.1 *Considerations about the Implementation*

My first intention was to do a *cross-sectional* analysis comparing as the *control* group incoming beneficiaries (that is, customers joining Bancamia last three months, that is from 1/12/2011 to 29/2/2012) with an *intervention group* of customers with 2 years or more of seniority (that is, customers who joined before 1/3/2010).

With that in mind, I asked for all the data available about all the beneficiaries within that range of time. This was done in order to compare the initial conditions of the beneficiaries of both the *intervention* and the *control* group, and to check if both groups were statistically different before joining Bancamia.

Sadly, most of the information received regarding assets, liabilities, incomes and expenses of the customers was non-coincident with the files stored in the office. The only information I could use in order to do a comparison was the amount of the first microcredit and the gender.

But on the other hand, the information stored in the files was really valuable, and of higher quality than any survey that I could have been able to do, as Bancamia's officials are professionally trained in order to do these *visits*—and they have experience when evaluating the assets and determining the income of the households based in the data they gather from the interviewee. With that in mind, I decided not to do the survey by myself, and instead try to gather as much information as possible from the files stored in Bancamia office in Armenia. This had the drawback that the individual level was not possible to be explored. But the advantage of having a high-quality data about the levels studied—household and enterprise—apart from the statistical and methodological benefits of being able to gather data from a larger sample.

In order to have comparable information with the *control* group, in the *intervention* group I just used data of beneficiaries that apart from the 2 years *seniority*, also did a renewal of the credit between 1/12/2011 to 29/2/2012, so I could have information from their current situation.

3.2.2 *Considerations about Potential Biases*

When implementing the *cross-sectional* analysis, I tried to find a design in order to overcome when possible the potential biases described in section 2.6.

First of all, the *fungibility* of the resources between the microenterprise and the household, is not directly monitored by Bancamia. Although one of the requirements of Bancamia is that the borrowers must be running its own business, they do not require the borrower to compulsory invest it in the business. So *fungibility* will have to be considered as part of the impact of the programme.

Endogeneity was not directly tracked, but following Hulme's recommendations I kept track of the *drop outs* and made some qualitative interviews (in company of a Bancamia official) in order to understand better the *causation process*.

About *selection bias* and the *hawtorne effect*, these biases were overcome by the *cross-sectional design* of the research, as both the intervention and control groups were formed by Bancamia customers. This gives raise, as discussed, to other two potential sources of bias, the biases caused by *drop outs* and the temporal issues.

Regarding to *drop outs* in the *intervention* group, it was not possible and not feasible to interview the customers who had defaulted, as they were hardly accessible by Bancamia officials and most of them were simply impossible to locate and/or to contact. In order to fill that gap, I decided to take information from *restructured credits*. When a Bancamia customer is having difficulties or starts not paying back the credit, the customer is offered the possibility of restructuring the credit by lowering monthly quotes and extending the credit in time. Most of the times, restructuring is not instant, so the typical restructuring is from a customer with a bad record of payment or that in one point refused to keep paying back the credit but was later convinced by Bancamia officials (source: Bancamia personnel). In that case, the main coercion is that if the credit is considered default, the default will be recorded in the registry of credit (Datacrédito), so the beneficiary would not be able to ask for another credit in any other credit institution in Colombia.

The other advantage of taking the information of *restructured credits* was that in the moment of restructuring another visit/interview was made to the beneficiary, keeping

new track of all the data regarding assets, liabilities, income and expenses. So for the purpose of this research I considered both the data of the beneficiaries when entering the programme and when restructuring the credit.

About the *peer selection problem,* a statistical comparison was made between the initial data of the *intervention* group—that is, the data of their first interview when they asked for the first credit—and the data of the control group to check that there were no significant statistical differences between both.

The *time of decision problem* is more difficult to track, as I can just state that the economy of Colombia had a steady growth last three years, but the implications of economic environment in the impact of the study are really hard to tell. Even though, with the purpose of having the maximum temporal consistency as possible, in the *intervention* group I just used data of beneficiaries that apart from the 2 years seniority, also did a renewal of the credit between 1/12/2011 to 29/2/2012, so I could have information from their current situation and from the same period of time than the control group—as with any renewal, a new visit is made and the data of the customer is then updated.

And last but not least, even though the reach of Bancamia is national the study conducted was only about microcredits conceded to by the branch of Armenia, Quindío between its opening in March 2009 and the 1st of March 2012. Even though this decision was discretional and not based in scientific considerations but in the own researcher material limitations, it also gives *geographic homogeneity* to the data.

3.3 STATISTICAL METHODOLOGY

Next, I will explain the decisions concerning the statistical methodology. Variables considered were quantitative as well as categorical, being some of categorical considered as ordinals. When categorical variables, *Chi squared* was used. Means estimated are presented with a confidence interval of 95% (*two-tailed*)[5]. In order to know if they were significant

5 As recommended by APA guidelines (American Psychologist Association) The use of confidence intervals is therefore strongly recommended (APA, p. 22:2001)

differences between means, the contrast used was the one-way ANOVA factorial analysis which if comparing just two samples is equivalent to the means comparison using the Student *T*.

I did not take in account the problem of non-normality of the dependent variable in the factorial analysis as this problem is considered practically irrelevant (Glass and Stanley, p. 373: 1974), and as it is showed by several researches that the means tend to a normal distribution even though the population they come from were not normal (Guilford and Fruchter, p. 277: 1973). In the case of heterocedasticity, non-parametric contrasts were also made like Mann-Whitney *U* in the case of two independent samples.

In order to measure effect size (*d*) I used Cohen's (1988) formula that takes a combined standard deviation of the *intervention* and *control* group. The level of two-tailed significance used was always 95%. The statistical software used in order to perform the calculations was *SPSS 20*.

4 ANALYTICAL PART

In order to understand how the information of each customer is tracked, I am going to explain how is the process that any applicant has to pass in order to become a customer of Bancamia.

First of all, the applicant is required to have a running microenterprise/source of income—Bancamia claims that 99 % of its customers are *microentrepeneurs* (Bancamia 2012a). When an applicant asks for a credit, a Bancamia official goes to his/her household in order to make a personal interview. In this interview the official asks the applicant about its sources of income, monthly expenses, and about their household and enterprise assets and liabilities. Monthly income and monthly expenses are carefully calculated with the help of the official, and an evaluation of the assets is made. The assets are physically checked and evaluated by the official, giving them a market value. In the case of the expenses, documentation and invoices are required in order to keep track of the exact monthly quantity. In the case of liabilities, the existence of a national *positive registry*[6] of credits (Datacrédito), makes things much easier, but *non-financial liabilities* (providers or even *informal* debts) are also asked in the interview.

Liability is always individual, so there is no intervention and/or formation of *groups* in any stage of the process. The *enforcement mechanism*s used by Bancamia are two. First of all, *peer pressure* is used, as each applicant is asked to leave five personal references that are checked by Bancamia officials—usually through a telephone interview. The second *enforcement mechanism* is the use of *credit-rationing*, that is, the first credit uses to be of a low quantity—around 2.000.000 COP—, and then if the customers prove to be trustworthy, can progressively go up to 15.000.000 COP. In the case of failure to pay, the customer is contacted by phone and by postal mail, and in case of permanent default it is registered in the registry of credits (Datacrédito), with the consequence of not having access to *formal* credit in Colombia until the debt is paid back. This can sometimes have the desired

6 A *positive registry* is that which keeps track not only of the individual's defaults, but also of the credits succesfully applied and paid back. So it could be considered a kind of credit history of each individual.

enforcement effect, but in other cases it will also leave the defaulted customer with the only alternative of the *informal* sector being the *gota a gota*—moneylenders, often depicted as dangerous—one of the most recurrent alternatives in these cases.

When a customer has a good repayment record, he may ask for a *renewal*, that is, for a new credit. This new credit is usually granted when the customer finishes paying the former credit. But sometimes the customer is offered to ask for a new credit while still paying back a former credit—this is referred as *paralelo*, a parallel credit—, or in some cases the best customers are offered a line of credit—referred as *cupo*—, with the limit of the total amount granted in the last credit. Every time a *renewal* is carried out, the financial data of the customer is updated by a Bancamia official.

When there is a failure to pay, the borrower can ask for *restructuring* the credit. In this case, the term for the credit is extended— trying to set smaller quotes and a longer term— and the interests are capitalized. Whenever the *restructuring* is made, the data of the customer is also updated.

4. 1 *Design Implementation*

In order to start with the *cross-sectional* analysis, my first step was to disaggregate the population of the office into *renewals*, *restructurings* and *new credits* and also by gender.

TABLE 3 — ARMENIA OFFICE COMPOSITION

by type of credit		
Renewals	1.205	60,34 %
Restructurings	321	16,07 %
New Credits	471	23,59 %
TOTAL	1.997	
by gender		
Men	807	40,41 %
Women	1.190	59,59 %
TOTAL	1.997	

Source: Author's Field Work

The next step was choosing which individuals were going to be part of each group. For that purpose I picked as potential subjects for the *intervention* group individuals that joined Bancamia two years ago—that is, before 1/3/2010—and made a *renewal* in the last three months—from 1/12/2011 to 29/2/2012—or were *restructured*. In the case of the *restructured* customers, I just take in account the date that they joined Bancamia, but not the *restructuring* date —given the scarcity of restructurings.

From that pool of potential subjects, I randomly picked 87 individuals for the *intervention* group. Before picking them, I divided the potential subjects in four groups according to the type of credit—*restructuring* and *renewal*—and gender.

In order to have a sample that reflects the reality of the office, the same proportion of *renewals/restructurings* and the same *male/female* proportion was kept in the *intervention group*.

Table 3 reflects office totals, and Table 4 the chosen sample for the *intervention* group.

I have to point out that the proportion between *renewals* and *restructurings* in the *intervention* group—18/69, that is 0,2609—tries matches the proportion between *renewals* and *restructurings* from the population of the office—321/1205, that is 0,2664 *renewals* for each *restructuring*.

TABLE 4 — INTERVENTION GROUP COMPOSITION

by gender and type of credit

	Men	Women	TOTAL	
Renewals	26	43	69	79,31 %
Restructurings	8	10	18	20,69 %
TOTAL	34	53	87	
	38,06 %	61,92 %		

Source: Author's Field Work

In the *control* group, I just cared to match the gender proportion, as all of the individuals in the sample are *new credits*—that is, customers joining Bancamia last three months before the start of the research, from 1/12/2011 to 29/2/2012. So I randomly picked (just with the restriction of matching the gender proportion) 87 out of the 148 individuals who were given a *new credit* during that period.

TABLE 5 — CONTROL GROUP COMPOSITION

by gender

Men	34	38,06 %
Women	53	61,92 %
TOTAL	87	

Source: Author's Field Work

4. 2 *Ex-ante Analysis*

In order to check that both *intervention* and *control* group were comparable, the only economic variable available I had before collecting the rest of the data was the Amount of the First microcredit. Even thought I was provided with a digital database with other measures, the figures did not match with the data stored physically at the office. So after checking that there was no statistically significant difference in the mean of the *Amount of the First Microcredit* between the *intervention* and the *control group* (see table 7), I proceeded to gather data from both groups.

TABLE 6 — DEMOGRAPHIC DATA COMPARISON

	Intervention Group (n = 87)	*Control Group (n = 87)*	*Anova Test (p-value)*
Gender			1,000
Male	39,08 % ± 5,26 %	39,08 % ± 5,26 %	
Female	60,92 % ± 5,26 %	60,92 % ± 5,26 %	
Marital Status			0,697
Single	*16 18,39 %*	*21 24,14 %*	
"Union Libre" [1]	*33 37,93 %*	*36 41,38 %*	
Married	*24 27,59 %*	*22 25,29 %*	
Separated	*9 10,34 %*	*4 4,60 %*	
Divorced	*2 2,30 %*	*2 2,30 %*	
Widow	*3 3,45 %*	*2 2,30 %*	
No. of Dependent People	1,26 ± 0,12	1,25 ± 0,15	0,952
No. of Children	1,14 ± 0,10	1,18 ± 0,11	0,763
Previous Experience[2]	75,31 ± 8,08	78,64 ± 9,82	0,794
Age 1st Microcredit	40,41 ± 1,47	40,36 ± 1,38	
Educational Level[3]	3,20 ± 0,15	3,51 ± 0,17	0,172/0,000★[5]
No Studies	*0 0,00 %*	*1 1,15 %*	
Imcomplete Primary School	*6 6,90 %*	*8 9,20 %*	
Primary School	*15 17,24 %*	*14 16,09 %*	
Incomplete Secondary School	*45 51,72 %*	*16 18,39 %*	
Secondary School	*12 13,79 %*	*35 40,23 %*	
"Técnico"	*2 2,30 %*	*5 5,75 %*	
"Especialización"	*7 8,05 %*	*8 9,20 %*	
Stratum[4]			0,000★
Estrato 1	*1 1,15 %*	*2 2,30 %*	
Estrato 2	*55 63,22 %*	*76 87,36 %*	
Estrato 3	*31 35,63 %*	*9 10,34 %*	

Source: Author's Field Work

1- "Union Libre" can be translated as a "Common Law Marriage", "Registered Domestic Partnership" or "Registered Civil Union".

2- In months.

3- Técnico is a higher degree than Secondary and Especialización is higher than Técnico. Both are under university degrees.

4- In Armenia, the city is classified in 8 kinds of "Estratos", taking in account its placement and other variables.

5- The first p-value is calculated taking each level as an integer from 1 to 7 and making an ANOVA one-way contrast. The second one is calculated using Ji-square.

★*Significant at the 95% level of confidence*

After gathering all the data, I had a great set of variables in order to check again if both groups were truly comparable.

First I checked the demographic data in table 6, making a comparison of means between both groups. While both groups seem to be similar in *Marital Status, Number of Dependent People* in the household, *Number of Children*, *Previous Experience* in the microenterprise sector and the *Age When Asking the First Microcredit,* there are statistically significant differences in two variables. In *Educational Level*, the *intervention* group has more individuals that finished Primary, while in the *control* group there is more than left it incomplete. The other significant difference is in the *Stratum* variable. In Colombia the cities are divided in 8 kinds of *estratos* numbered from 1 to 8. This division is based in several variables including income, placement or value of the houses. The difference shows than the Armenia office is trying to pursue customer from a poorer background, probably due to the *peer selection problem*—as best potential customers were already targeted and now the only option is to pursue customers from a *poorer* range than two years ago.

Checking the economic variables in table 7 and 8 we can have a better picture of the situation. Table 7 show a comparison of the means of the *intervention* and the *control* group in *t-1* —that is, before receiving the first microcredit. All the variables are expressed in COP.

The variables in table 7 (and in following tables 8, 9 and 10) are based in the data that Bancamia store from its customers. This data is structured in two main sections. First section can be defined as analogous to a *profit and loss account* applied both at a *household* and *enterprise* level. This section is divided in two categories that reflect the incomes and outcomes of each individual. The *Total Income* category (A) is disaggregated into different sub-items reflecting different sources of income. The *Total Expenses* (B) category is disaggregated in sub-categories, two of them belonging to the *enterprise* level—*Cost of Goods* (1) *and Microenterprise Expenses* (2)—, and the other to the *household* level—*Family Expenses* (3). The other category *Short-Term Liabilities* (4) refers to the amount of money destined for debt repayment every month, so can be seen both at the *household* and *enterprise* level.

Second section is analogous to a *balance sheet*, also applied both at a *household* and *enterprise* level. It is also divided in two categories, one reflecting the assets and the other the liabilities of each individual. The *Total Assets* category (C) is disaggregated in five sub-categories, three at the *microenterprise* level—*Accounts Receivable* (2), *Inventory* (3) and *Microenterprise Assets* (4)—, one at the household level—*Household Assets* (5)—, and the last one at both levels, *Cash and Banks* (1). The *Total Liabilities* (D) category is disaggregated in *Suppliers* (1), *Financial Liabilities* (2) and *Others* (3). All three sub-categories can apply both at *enterprise* and at *household* level, and the category *Others* (3) would reflect *informal* credit market.

TABLE 7 — MEANS COMPARISON T-1

	Intervention Group (n = 87)		*Control Group (n = 87)*		*Anova Test (p-value)*	*Effect Size (d)*
A—TOTAL INCOME	2.953.974,71 ±	238.836,36	2.856.856,26 ±	283.715,75	0,794	0,040
Sales	2.806.443,23 ±	231.877,47	2.798.867,76 ±	286.183,82	0,984	0,003
Couple	48.701,15 ±	24.968,90	13.793,10 ±	9.730,73	0,448(1)	0,197
Sons	2.816,09 ±	2.013,56	0,00 ±	0,00	0,156(1)	0,211
Subsidies	21.264,37 ±	13.645,57	5.114,94 ±	3.812,44	0,397(1)	0,173
Rents	12.988,51 ±	5.808,39	8.620,69 ±	4.417,93	0,550	0,091
Interests	0,00 ±	0,00	0,00 ±	0,00	-	-
Salaries	31.228,74 ±	12.050,33	14.942,53 ±	8.732,68	0,203(1)	0,166
Additional Incomes/Others	30.532,63 ±	9.521,62	15.517,24 ±	12.133,71	0,332	0,148
B—TOTAL EXPENSES (1+2+3+4)	2.648.123,26 ±	225.873,36	2.524.768,55 ±	273.433,15	0,728	0,053
(1)Cost of Goods	1.436.963,78 ±	168.023,01	1.416.483,68 ±	201.478,86	0,938	0,012
(2)Microenterprise expenses	406.427,17 ±	63.097,72	480.347,43 ±	89.697,67	0,501	-0,102
Number of Employees	0,08 ±	0,04	0,26 ±	0,08	0,004★(1)	-0,321
Personnel Cost	80.866,09 ±	28.372,79	116.666,67 ±	37.648,63	0,449	-0,115
Rent	82.471,26 ±	24.380,03	104.195,40 ±	27.448,75	0,555	-0,090
Supplies	28.356,32 ±	7.758,00	41.954,02 ±	11.667,15	0,333	-0,147
Transportation	48.229,89 ±	9.919,30	40.689,66 ±	11.804,61	0,625	0,074
Food	17.126,44 ±	5.432,16	13.793,10 ±	9.833,20	0,767	0,045
Publicity	0,00 ±	0,00	0,00 ±	0,00	-	
Vigilance	252,87 ±	252,87	0,00 ±	0,00	0,317(1)	0,152
Others	149.124,30 ±	26.806,45	163.048,57 ±	39.713,76	0,772	-0,044
MICROENTERPRISE TOTAL COST(1 + 2)	1.843.390,95 ±	194.601,42	1.896.831,10 ±	239.620,32	0,863	-0,026
(3)Family Expenses	595.971,39 ±	35.607,24	525.445,47 ±	22.533,99	0,002★(1)	0,237
Food	255.195,40 ±	18.886,84	219.195,40 ±	12.886,34	0,286(1)	0,238
Education	41.091,95 ±	8.133,98	17.321,84 ±	4.331,32	0,018★(1)	0,385
Health	18.551,72 ±	3.756,55	12.160,92 ±	2.747,64	0,808(1)	0,208
Insurances	2.298,85 ±	889,23	3.551,72 ±	1.416,55	0,455	-0,114
Transportation	33.344,83 ±	4.223,91	27.068,97 ±	6.011,41	0,394	0,130
Supplies	76.956,32 ±	6.664,18	62.436,78 ±	4.776,16	0,215(1)	0,267
Rents	65.344,83 ±	11.844,35	47.758,62 ±	10.186,63	0,262	0,171
Others	103.187,48 ±	10.387,28	65.425,29 ±	6.179,87	0,009★(1)	0,462
(4)Short-Term Liabilities	208.760,92 ±	32.593,83	173.017,91 ±	39.980,03	0,489	0,105
LIQUIDITY (A-B)	305.851,45 ±	44.227,48	332.087,71 ±	27.305,68	0,614	-0,077
NET INCOME(2)	963.052,28 ±	68.775,99	902.036,66 ±	64.803,79	0,519	0,098

TABLE 7 — MEANS COMPARISON T-1 (*continued*)

	Intervention Group (n = 87)		*Control Group (n = 87)*		*Anova Test (p-value)*	*Effect Size (d)*
C—TOTAL ASSETS (1+2+3+4+5)	9.257.635,99 ±	1.560.817,06	7.306.760,92 ±	972.179,53	0,290	0,161
(1)Cash and Banks	344.600,00 ±	67.602,60	486.574,71 ±	175.493,97	0,451	-0,115
(2)Acounts Receivable	877.122,99 ±	220.793,23	903.574,71 ±	235.843,75	0,935	-0,012
(3)Inventary	2.693.890,01 ±	796.084,87	2.157.048,28 ±	602.493,40	0,591	0,082
Raw Materials	2.634.355,53 ±	795.846,64	906.413,79 ±	239.222,40	0,039★	0,312
Work in Progress	47.465,52 ±	28.178,52	19.885,06 ±	19.885,06	0,425	0,121
Finished Goods	12.068,97 ±	11.494,96	1.230.749,43 ±	542.223,46	0,000★(1)	-0,337
(4)Microenterprise Assets	3.601.793,10 ±	787.552,66	2.500.195,40 ±	347.823,48	0,569(1)	0,194
TV	29.770,11 ±	13.925,93	80.804,60 ±	31.733,83	0,308(1)	-0,223
Music System	29.310,34 ±	13.789,76	18.965,52 ±	7.935,91	0,516	0,099
DVD	3.333,33 ±	1.904,33	0,00 ±	0,00	0,081(1)	0,264
Refrigerator	174.482,76 ±	98.300,69	119.540,23 ±	27.629,75	0,591	0,082
Washing Machine	40.804,60 ±	35.946,07	8.045,98 ±	5.714,96	0,369	0,137
Computer/Game Console	168.965,52 ±	84.892,82	208.620,69 ±	64.208,25	0,710	-0,057
Vehicle	714.942,53 ±	386.121,60	468.965,52 ±	236.675,44	0,588	0,083
Others	2.440.183,91 ±	682.520,44	1.595.252,87 ±	266.827,36	0,251	0,175
MICROENTERPRISE TOTAL (2 + 3 + 4)	7.172.806,10 ±	1.310.541,06	5.560.818,39 ±	934.109,15	0,318	0,152
(5)Household Assets	1.740.229,89 ±	289.752,51	1.259.367,82 ±	94.089,77	0,116	0,238
TV	435.287,36 ±	32.325,38	454.942,53 ±	51.412,26	0,259(1)	-0,049
Music System	197.701,15 ±	19.846,17	129.310,34 ±	17.060,67	0.005★(1)	0,390
DVD	42.988,51 ±	6.455,73	20.574,71 ±	3.921,70	0,008★(1)	0,440
Refrigerator	227.241,38 ±	19.837,41	200.517,24 ±	20.466,37	0,350	0,142
Washing Machine	195.517,24 ±	22.271,90	176.781,61 ±	20.402,59	0,536	0,094
Computer/Game Console	212.643,68 ±	45.037,17	183.333,33 ±	34.794,88	0,607	0,078
Vehicle	263.448,28 ±	230.873,01	9.195,40 ±	9.195,40	0,305(1)	0,167
Others	165.402,30 ±	31.615,19	84.712,64 ±	21.731,91	0,005★(1)	0,316
D—TOTAL LIABILITIES (1+2+3)	2.170.425,28 ±	395.328,03	2.160.084,97 ±	705.438,18	0,990	0,002
(1)Suppliers	65.632,18 ±	40.191,37	15.574,71 ±	15.574,71	0,056(1)	0,176
(2)Financial Liabilities	2.099.252,86 ±	394.615,25	2.119.728,64 ±	706.450,60	0,980	-0,004
Number of Credits	1,10 ±	0,13	0,97 ±	0,22	0,589	0,082
(3)Others	5.540,23 ±	3.584,99	24.781,61 ±	14.915,88	0,458(1)	-0,190
PATRIMONY (C-D)	7.087.210,71 ±	1.383.085,98	5.146.675,95 ±	476.063,86	0,186	0,201
REINVESTMENT(3)	5.002.380,83 ±	1.125.428,90	3.400.733,43 ±	426.490,39	0,185	0,201
AMOUNT 1ST MICROCREDIT	2.116.401,77 ±	183.830,10	2.052.512,06 ±	143.575,18	0,784	0,042

Source: Author's Field Work

All data in Colombian Pesos (COP)

Means are presented with a 95% of confidence level interval

1- Non homogeneous variance—Alternative parametric contrasts were also calculated (Mann-Whitney "U" for two independent samples)

2- Net Income tries to reflect the net income of the Enterprise, and is a difference between Sales and Microenterprise Total Cost

★*Significant at the 95% level of confidence*

In both sections, some sub-categories are disaggregated in items, reflecting the detail of Bancamia data. I also use two additional measures, *Liquidity*—the difference between the amount of *Total Income* and *Total Expenses*—and *Patrimony*—the difference between the amount of *Total Assets* and *Total Liabilities*.

When taking in account economic variables, the means of both groups—*intervention* and *control*—are statistically comparable in the four aggregated categories—*Total Income* (A), *Total Expenses* (B), *Total Assets* (C) and *Total Liabilities* (D)—and in additional measures *Liquidity* and *Patrimony*. In the subcategories, the only significant difference is in *Family Expenses* (B-3) where there is also a significant difference in the item *Education*—which is coherent with the differences observed in educational level—and in *Others*.

Although there is not a significant difference in the subcategory *Household Assets* (C-5), there are significant differences in three of its sub-items, *Music Equipment, DVD and Others*. This can be explained in relation with the fact that Bancamia is now targeting to customers in a poorer *strata*. Finally, there is another significant difference in *Number of Employees*. The difference in *Raw Material* and *Finished Goods* may reflect different nature of the business.In order to make a deeper analysis, in table 8 I analyse the proportions within each category— *Total Income* (A), *Total Expenses* (B), *Total Assets* (C) and *Total Liabilities* (D)—in *t-1*, in order to check if the proportions of both groups are statistically different.

TABLE 8 — MEANS COMPARISON - PROPORTIONS T-1

	Intervention Group (n = 87)		*Control Group (n = 87)*		*Anova Test (p-value)*	*Effect Size (d)*
A—TOTAL INCOME	*100 %*		*100 %*			
Sales	92,99 % ±	1,29 %	96,55 % ±	1,08 %	0,002[(1)]*	-0,318
Couple	1,46 % ±	0,72 %	0,57 % ±	0,38 %	0,463[(1)]	0,166
Sons	0,25 % ±	0,20 %	0,00 % ±	0,00 %	0,156[(1)]	0,193
Subsidies	0,85 % ±	0,49 %	0,27 % ±	0,19 %	0,397[(1)]	0,166
Rents	0,64 % ±	0,36 %	0,39 % ±	0,22 %	0,567	0,087
Interests	0,00 % ±	0,00 %	0,00 % ±	0,00 %	-	-
Salaries	1,74 % ±	0,69 %	1,10 % ±	0,63 %	0,495	0,104
Additional Incomes/Others	2,08 % ±	0,66 %	1,12 % ±	0,81 %	0,360	0,139
B—TOTAL EXPENSES (1+2+3+4)	*100 %*		*100 %*			
(1)Cost of Goods	44,97 % ±	2,97 %	45,74 % ±	3,16 %	0,860	-0,027
(2)Microenterprise expenses	14,93 % ±	1,84 %	20,05 % ±	2,45 %	0,229[(1)]	-0,252
Number of Employees						
Personnel Cost	1,61 % ±	0,57 %	2,95 % ±	0,81 %	0,141[(1)]	-0,206
Rent	2,67 % ±	0,68 %	3,03 % ±	0,70 %	0,711	-0,056
Supplies	0,91 % ±	0,25 %	1,60 % ±	0,38 %	0,100[(1)]	-0,228
Transportation	1,86 % ±	0,35 %	1,80 % ±	0,54 %	0,929	0,014
Food	0,66 % ±	0,20 %	0,41 % ±	0,29 %	0,487	0,106
Publicity	0,00 % ±	0,00 %	0,00 % ±	0,00 %	-	-
Vigilance	0,00 % ±	0,00 %	0,00 % ±	0,00 %	0,317[(1)]	0,152
Others	7,23 % ±	1,48 %	10,26 % ±	2,13 %	0,847[(1)]	-0,177
MICROENTERPRISE TOTAL (1 + 2)	59,90 % ±	2,46 %	65,79 % ±	2,18 %	0,784	
(3)Family Expenses	30,95 % ±	2,09 %	27,19 % ±	1,93 %	0,189	0,199
Food	13,50 % ±	1,14 %	13,62 % ±	1,21 %	0,944	-0,011
Education	2,24 % ±	0,49 %	0,99 % ±	0,37 %	0,043*	0,306
Health	0,73 % ±	0,15 %	0,60 % ±	0,13 %	0,962[(1)]	0,100
Insurances	0,13 % ±	0,06 %	0,22 % ±	0,14 %	0,544	-0,092
Transportation	1,58 % ±	0,22 %	1,35 % ±	0,23 %	0,482	0,107
Supplies	4,73 % ±	0,68 %	3,65 % ±	0,37 %	0,599[(1)]	0,211
Rents	2,81 % ±	0,56 %	2,34 % ±	0,53 %	0,542	0,093
Others	5,22 % ±	0,54 %	4,41 % ±	0,53 %	0,287	0,162
(4)Short-Term Liabilities	9,15 % ±	1,33 %	7,02 % ±	1,09 %	0,215	0,188

TABLE 8 — MEANS COMPARISON - PROPORTIONS T-1 (*continued*)

	Intervention Group (n = 87)		*Control Group (n = 87)*		*Anova Test (p-value)*	*Effect Size (d)*
C—TOTAL ASSETS (1+2+3+4+5)	*100 %*		*100 %*			
(1)Cash and Banks	4,78 % ±	0,77 %	5,99 % ±	1,35 %	0,437	-0,118
(2)Acounts Receivable	10,20 % ±	1,68 %	10,75 % ±	1,54 %	0,810	-0,037
(3)Inventary	25,50 % ±	2,28 %	20,96 % ±	2,24 %	0,158	0,214
Raw Materials	24,82 % ±	2,28 %	10,54 % ±	1,80 %	0,000★(1)	0,700
Work in Progress	0,62 % ±	0,34 %	0,75 % ±	0,75 %	0,876	-0,024
Finished Goods	0,06 % ±	0,04 %	9,68 % ±	1,89 %	0,000★(1)	-0,723
(4)Microenterprise Assets	33,32 % ±	2,65 %	34,94 % ±	2,97 %	0,684	-0,062
TV	0,46 % ±	0,24 %	1,15 % ±	0,44 %	0,297(1)	-0,208
Music System	0,47 % ±	0,30 %	0,26 % ±	0,11 %	0,509	0,100
DVD	0,05 % ±	0,03 %	0,00 % ±	0,00 %	0,081(1)	0,251
Refrigerator	2,35 % ±	0,61 %	3,50 % ±	0,92 %	0,297	-0,158
Washing Machine	0,45 % ±	0,37 %	0,24 % ±	0,17 %	0,606	0,079
Computer/Game Console	2,56 % ±	1,04 %	2,71 % ±	0,97 %	0,916	-0,016
Vehicle	4,75 % ±	1,74 %	3,75 % ±	1,81 %	0,692	0,060
Others	22,24 % ±	2,21 %	23,33 % ±	2,56 %	0,769(1)	-0,049
MICROENTERPRISE TOTAL (2 + 3 + 4)	69,01 % ±	1,92 %	66,65 % ±	2,42 %	0,614	
(5)Household Assets	26,21 % ±	1,76 %	27,36 % ±	2,23 %	0,971(1)	-0,061
TV	7,86 % ±	0,63 %	9,50 % ±	0,95 %	0,538(1)	-0,217
Music System	4,11 % ±	0,58 %	3,53 % ±	0,63 %	0,503	0,102
DVD	0,78 % ±	0,13 %	0,53 % ±	0,13 %	0,179	0,204
Refrigerator	4,06 % ±	0,41 %	4,33 % ±	0,58 %	0,415	-0,060
Washing Machine	3,34 % ±	0,46 %	3,99 % ±	0,62 %	0,394	-0,130
Computer/Game Console	3,07 % ±	0,76 %	3,43 % ±	0,75 %	0,736	-0,051
Vehicle	0,57 % ±	0,33 %	0,07 % ±	0,07 %	0,305	0,226
Others	2,43 % ±	0,46 %	1,97 % ±	0,56 %	0,525	0,097
D—TOTAL LIABILITIES (1+2+3)	*100 %*		*100 %*			
(1)Suppliers	6,28 % ±	2,86 %	2,08 % ±	2,08 %	0,105(1)	0,219
(2)Financial Liabilities *Number of Credits*	91,26 % ±	3,31 %	90,67 % ±	4,05 %	0,910	0,022
(3)Others	2,46 % ±	1,83 %	7,24 % ±	3,57 %	0,000★	-0,244

Source: Author's Field Work

Means are presented with a 95% of confidence level interval

1- Non homogeneous variance—Alternative parametric contrasts were also calculated (Mann-Whitney "U" for two independent samples)

★*Significant at the 95% level of confidence*

When checking the proportions in *t-1*, there is a significant difference in the proportion of *Total Income* (A) that comes from *Sales*. The share of *Sales* is greater in the *control* group. But as checked in table 7, the total amount of *Sales* in COP is almost identical in both groups. This difference in proportions is caused by differences in the amount of the rest of the sources of income—that is, in the *intervention* group the sources of income seem more diversified.

Another significant difference is in the share of *Education* expenses over the *Total Expenses* (B). This is coherent with the observed difference in *Education Level* and in the total amount of *Education* expenses. Finally, there is a significant difference in the share of *Others* (D-3) with respect to *Total Liabilities* (D). This may mean that the *control* group has a greater share of credits in the *informal* sector.

4. 3 *Ex-post Analysis*

Now let's check the results of the comparison after treatment (*t*-2) in Table 9 and 10.

TABLE 9 — MEANS COMPARISON T-2

	Intervention Group (n = 87)			*Control Group (n = 87)*			*Anova Test (p-value)*	*Effect Size (d)*
A—TOTAL INCOME	3.595.896,93	±	448.918,55	2.856.856,26	±	283.715,75	0,166	0,210
Sales	3.506.529,22	±	451.912,04	2.798.867,76	±	286.183,82	0,188	0,200
Couple	6.896,55	±	5.847,82	13.793,10	±	9.730,73	0,544	-0,092
Sons	1.724,14	±	1.724,14	0,00	±	0,00	0,317(1)	0,152
Subsidies	19.476,91	±	11.264,09	5.114,94	±	3.812,44	0,629(1)	0,183
Rents	7.931,03	±	4.667,90	8.620,69	±	4.417,93	0,915	-0,016
Interests	0,00	±	0,00	0,00	±	0,00	-	-
Salaries	35.195,40	±	15.315,25	14.942,53	±	8.732,68	0306(1)	0,174
Additional Incomes/Others	18.143,68	±	7.135,63	15.517,24	±	12.133,71	0,852	0,028
B—TOTAL EXPENSES (1+2+3+4)	3.252.433,69	±	465.613,32	2.524.768,55	±	273.433,15	0,180	0,204
(1)Cost of Goods	2.005.873,94	±	404.518,80	1.416.483,68	±	201.478,86	0,194	0,197
(2)Microenterprise expenses	432.792,20	±	80.747,10	480.347,43	±	89.697,67	0,694	-0,060
Number of Employees	0,08	±	0,03	0,26	±	0,08	0,015★(1)	-0,333
Personnel Cost	38.735,63	±	17.183,23	116.666,67	±	37.648,63	0,026★(1)	-0,283
Rent	93.103,45	±	42.557,98	104.195,40	±	27.448,75	0,827	-0,033
Supplies	35.816,09	±	8.132,84	41.954,02	±	11.667,15	0,667	-0,066
Transportation	67.022,99	±	26.158,69	40.689,66	±	11.804,61	0,360	0,139
Food	12.643,68	±	4.412,75	13.793,10	±	9.833,20	0,915	-0,016
Publicity	0,00	±	0,00	0,00	±	0,00	-	-
Vigilance	1.000,00	±	614,14	0,00	±	0,00	0,081(1)	0,246
Others	184.470,36	±	47.731,33	163.048,57	±	39.713,76	0,731	0,052
MICROENTERPRISE TOTAL COST (1 + 2)	2.438.666,14	±	448.336,74	1.896.831,10	±	239.620,32	0,288	0,162
(3)Family Expenses	532.724,14	±	30.975,29	454.919,54	±	25.678,48	0,055	0,291
Food	251.954,02	±	16.048,28	219.195,40	±	12.886,34	0,113	0,240
Education	24.137,93	±	4.682,66	17.321,84	±	4.331,32	0,287	0,162
Health	17.137,93	±	3.284,23	12.160,92	±	2.747,64	0,247	0,176
Insurances	3.643,68	±	1.089,91	3.551,72	±	1.416,55	0,959	0,008
Transportation	32.586,21	±	3.923,78	27.068,97	±	6.011,41	0,443	0,117
Supplies	72.977,01	±	5.553,44	62.436,78	±	4.776,16	0,152	0,218
Rents	46.264,37	±	10.683,10	47.758,62	±	10.186,63	0,919	-0,015
Others	84.022,99	±	9.119,20	65.425,29	±	6.179,87	0,315(1)	0,255
(4)Short-Term Liabilities	281.043,41	±	39.769,71	173.017,91	±	39.980,03	0,057	0,288
LIQUIDITY (A-B)	343.463,24	±	45.372,31	332.087,71	±	27.305,68	0,830	0,007
NET INCOME(2)	1.067.863,08	±	75.364,31	902.036,66	±	64.803,79	0,096	0,252

TABLE 9 — MEANS COMPARISON T-2 (*continued*)

	Intervention Group (n = 87)		*Control Group (n = 87)*		*Anova Test (p-value)*	*Effect Size (d)*
C—TOTAL ASSETS (1+2+3+4+5)	10.666.754,48 ±	1.407.145,36	7.306.760,92 ±	972.179,53	0,051	0,295
(1)Cash and Banks	325.298,85 ±	47.506,27	486.574,71 ±	175.493,97	0,082(1)	-0,135
(2)Acounts Receivable	1.220.229,89 ±	281.130,34	903.574,71 ±	235.843,75	0,389	0,131
(3)Inventary	3.203.402,30 ±	641.688,24	2.157.048,28 ±	602.493,40	0,236	0,180
Raw Materials	2.839.632,18 ±	642.381,75	906.413,79 ±	239.222,40	0,000★(1)	0,419
Work in Progress	26.298,85 ±	24.083,22	19.885,06 ±	19.885,06	0,838	0,031
Finished Goods	334.770,11 ±	134.375,13	1.230.749,43 ±	542.223,46	0,002★(1)	-0,242
(4)Microenterprise Assets	3.642.995,86 ±	787.829,78	2.500.195,40 ±	347.823,48	0,759(1)	0,201
TV	13.563,22 ±	7.424,17	80.804,60 ±	31.733,83	0,035★(1)	-0,310
Music System	29.310,34 ±	13.813,97	18.965,52 ±	7.935,91	0,517	0,099
DVD	3.333,33 ±	1.904,33	0,00 ±	0,00	0,081(1)	0,264
Refrigerator	196.896,55 ±	98.391,27	119.540,23 ±	27.629,75	0,450	0,115
Washing Machine	2.298,85 ±	2.298,85	8.045,98 ±	5.714,96	0,352	-0,142
Computer/Game Console	239.655,17 ±	106.849,55	208.620,69 ±	64.208,25	0,804	0,038
Vehicle	519.540,23 ±	350.746,10	468.965,52 ±	236.675,44	0,905	0,018
Others	2.638.398,16 ±	700.810,14	1.595.252,87 ±	266.827,36	0,468(1)	0,210
MICROENTERPRISE TOTAL (2 + 3 + 4)	8.066.628,05 ±	1.146.276,17	5.560.818,39 ±	934.109,15	0,092	0,747
(5)Household Assets	2.274.827,59 ±	454.916,09	1.259.367,82 ±	94.089,77	0,030★	0,328
TV	457.011,49 ±	32.509,79	454.942,53 ±	51.412,26	0,085(1)	0,005
Music System	236.321,84 ±	23.385,66	129.310,34 ±	17.060,67	0,000★	0,541
DVD	43.448,28 ±	6.280,93	20.574,71 ±	3.921,70	0,004★(1)	0,457
Refrigerator	229.540,23 ±	21.482,67	200.517,24 ±	20.466,37	0,329	0,148
Washing Machine	240.344,83 ±	21.259,11	176.781,61 ±	20.402,59	0,032★	0,324
Computer/Game Console	250.574,71 ±	46.978,29	183.333,33 ±	34.794,88	0,532(1)	0,174
Vehicle	252.873,56 ±	230.765,49	9.195,40 ±	9.195,40	0,552(1)	0,160
Others	564.712,64 ±	355.328,55	84.712,64 ±	21.731,91	0,001★(1)	0,204
D—TOTAL LIABILITIES(2) (1+2+3)	3.734.902,30 ±	735.299,85	2.160.084,97 ±	705.438,18	0,122	0,233
(1)Suppliers	0,00 ±	0,00	15.574,71 ±	15.574,71	0,317(1)	-0,152
(2)Financial Liabilities	3.725.465,52 ±	735.555,21	2.119.728,64 ±	706.450,60	0,117	0,238
Number of Credits	1,56 ±	0,18	0,97 ±	0,22	0,037★	0,316
(3)Others	9.436,78 ±	6.313,61	24.781,61 ±	14.915,88	0,345	-0,144
PATRIMONY (C-D)	6.931.852,18 ±	1.317.415,85	5.146.675,95 ±	476.063,86	0,073(1)	0,193
REINVESTMENT(3)	4.331.725,75 ±	1.126.251,40	3.407.767,91 ±	426.025,96	0,362(1)	0,116
MICROCREDIT TOTAL	7.563.832,89 ±	504.619,18	2.052.512,06 ±	143.575,18		

Source: Author's Field Work

All data in Colombian Pesos (COP)

Means are presented with a 95% of confidence level interval

1- Non homogeneous variance—Alternative parametric contrasts were also calculated (Mann-Whitney "U" for two independent samples)

2- Net Income tries to reflect the net income of the Enterprise, and is a difference between Sales and Microenterprise Total Cost

3- Reinvestment is a difference between Microenterprise Total and Total Liabilities

★*Significant at the 95% level of confidence*

In tables 9 and 10, the comparison is made between the means of the *intervention* group after two years—that is, the data obtained in the moment of the *renewal* or *restructuring*—and the means of the *control* group when entering the programme.

In the category of *Total Expenses* (B) *Number of Employees* is significantly lower in the *intervention* group in *t-2,* difference also observed in *t-1.* But *Personnel Cost* is also significantly lower in the *intervention* group in *t-2*, as opposed as in *t-1*.

Another interesting fact is that the differences in *Family Expenses* (B-3) and its item *Education*—that were both significantly different in *t-1* —are not significant in *t-2*. This cannot be considered statistically as a proof that the level of expenses in both items has decreased in the *intervention* group, but it is clearly a hint in that direction.

In the side of the assets, the subcategory *Microenterprise Assets* (C-4) shows no significant difference, but there is one significant difference in one of its items, being the amount in *TV* assets in the microenterprise significantly lower in the *intervention* group.

The subcategory *Household Assets* (C-5) now shows a significant difference, being the total value of the assets in the household of the *intervention* group greater than in the *control* group. In the items of *Household Assets* (C-5), there are still significant differences in *TV* and *Music System*, *DVD, Others* and now also *Washing Machine* shows significant differences being the amount greater in the *intervention* group.

Finally, there is a significant difference in the *Number of Credits*, being greater the number in the *intervention* group.

When checking the proportions in *t-2* (Table 10), there is no longer a significant difference in the proportion of *Total Income* (A) that comes from *Sales*. When checking the expenses, in the subcategory *Microenterprise Expenses* (B-4), there is significant difference in the share of *Personnel Costs,* which is also observed when comparing absolute amounts The amount of Short-Term Liabilities is also significantly higher in the *intervention* group, probably reflecting the higher monthly payments of those still paying a former microcredit in *t-2*.

In the assets side I find no significant different in subcategories. There is just a significant different in the share of a *Microenterprise Assets* (C-4) item—*TV*—and in the share of a *Household Assets* (C-5) item—*Others*.

TABLE 10 — MEANS COMPARISON - PROPORTIONS T-2

	Intervention Group (n = 87)		*Control Group (n = 87)*		*Anova Test (p-value)*	*Effect Size (d)*
A—TOTAL INCOME	*100 %*		*100 %*			
Sales	94,71% ±	1,31%	96,55% ±	1,08%	0,279	-0,165
Couple	0,81% ±	0,73%	0,57% ±	0,38%	0,772	0,044
Sons	0,12% ±	0,12%	0,00% ±	0,00%	0,317(1)	0,152
Subsidies	0,53% ±	0,34%	0,27% ±	0,19%	0,502	0,102
Rents	0,70% ±	0,43%	0,39% ±	0,22%	0,527	0,096
Interests	0,00% ±	0,00%	0,00% ±	0,00%	-	-
Salaries	1,96% ±	0,88%	1,10% ±	0,63%	0,424	0,122
Additional Incomes/Others	1,18% ±	0,45%	1,12% ±	0,81%	0,950	0,010
B—TOTAL EXPENSES (1+2+3+4)	*100 %*		*100 %*			
(1)Cost of Goods	46,61% ±	3,08%	45,74% ±	3,16%	0,843	0,030
(2)Microenterprise expenses	13,99% ±	1,76%	20,05% ±	2,45%	0,206(1)	-0,302
Number of Employees						
Personnel Cost	0,52% ±	0,20%	2,95% ±	0,81%	0,018★(1)	-0,432
Rent	1,44% ±	0,41%	3,03% ±	0,70%	0,197(1)	-0,294
Supplies	1,16% ±	0,27%	1,60% ±	0,38%	0,346	-0,143
Transportation	1,82% ±	0,31%	1,80% ±	0,54%	0,973	0,005
Food	0,49% ±	0,19%	0,41% ±	0,29%	0,819	0,035
Publicity	0,00% ±	0,00%	0,00% ±	0,00%	-	-
Vigilance	0,03% ±	0,02%	0,00% ±	0,00%	0,081(1)	0,185
Others	8,53% ±	1,74%	10,26% ±	2,13%	0,530	-0,095
MICROENTERPRISE TOTAL (1 + 2)	60,60% ±	2,47%	65,79% ±	2,18%	0,117	
(3)Family Expenses	27,57% ±	2,07%	27,19% ±	1,93%	0,894	0,020
Food	12,91% ±	1,15%	13,62% ±	1,21%	0,672	-0,064
Education	1,27% ±	0,28%	0,99% ±	0,37%	0,550	0,091
Health	0,63% ±	0,13%	0,60% ±	0,13%	0,902	0,019
Insurances	0,18% ±	0,06%	0,22% ±	0,14%	0,783	-0,042
Transportation	1,56% ±	0,24%	1,35% ±	0,23%	0,523	0,097
Supplies	4,25% ±	0,58%	3,65% ±	0,37%	0,381	0,133
Rents	1,84% ±	0,51%	2,34% ±	0,53%	0,493	-0,104
Others	4,93% ±	0,81%	4,41% ±	0,53%	0,593	0,081
(4)Short-Term Liabilities	11,83% ±	1,47%	7,02% ±	1,09%	0,005★(1)	0,393

TABLE 10 — MEANS COMPARISON - PROPORTIONS T-2 (*continued*)

	Intervention Group (n = 87)		*Control Group (n = 87)*		*Anova Test (p-value)*	*Effect Size (d)*
C—TOTAL ASSETS (1+2+3+4+5)	*100 %*		*100 %*			
(1)Cash and Banks	3,86% ±	0,46%	5,98% ±	1,28%	0,917[1]	-0,230
(2)Acounts Receivable	11,15% ±	1,60%	10,76% ±	1,47%	0,858	0,027
(3)Inventary	27,03% ±	2,57%	21,30% ±	2,16%	0,066[1]	0,251
Raw Materials	23,44% ±	2,62%	10,71% ±	1,76%	0,000*[1]	0,571
Work in Progress	0,23% ±	0,19%	0,71% ±	0,71%	0,520	-0,095
Finished Goods	3,28% ±	1,11%	9,88% ±	1,83%	0,002*[1]	-0,444
(4)Microenterprise Assets	30,38% ±	2,72%	34,98% ±	2,84%	0,243	-0,172
TV	0,30% ±	0,14%	1,09% ±	0,42%	0,032*[1]	-0,263
Music System	0,35% ±	0,20%	0,25% ±	0,10%	0,633	0,071
DVD	0,06% ±	0,04%	0,00% ±	0,00%	0,081[1]	0,234
Refrigerator	2,00% ±	0,53%	3,58% ±	0,89%	0,719[1]	-0,223
Washing Machine	0,11% ±	0,09%	0,22% ±	0,16%	0,552[1]	-0,096
Computer/Game Console	2,84% ±	1,15%	2,56% ±	0,92%	0,852	0,028
Vehicle	2,89% ±	1,28%	3,55% ±	1,71%	0,577[1]	-0,046
Others	21,84% ±	2,43%	23,73% ±	2,45%	0,664[1]	-0,081
MICROENTERPRISE TOTAL (2 + 3 + 4)	68,57% ±	2,27%	67,04% ±	2,31%	0,638	
(5)Household Assets	27,57% ±	2,26%	26,97% ±	2,12%	0,847	0,029
TV	7,13% ±	0,67%	9,42% ±	0,91%	0,065[1]	-0,296
Music System	3,82% ±	0,49%	3,52% ±	0,59%	0,689	0,059
DVD	0,61% ±	0,09%	0,51% ±	0,12%	0,538	0,091
Refrigerator	3,88% ±	0,47%	4,30% ±	0,56%	0,964[1]	-0,084
Washing Machine	3,52% ±	0,39%	3,93% ±	0,60%	0,555[1]	-0,086
Computer/Game Console	4,40% ±	0,95%	3,37% ±	0,71%	0,389	0,127
Vehicle	0,36% ±	0,26%	0,06% ±	0,06%	0,552[1]	0,165
Others	3,86% ±	1,14%	1,86% ±	0,53%	0,002*[1]	0,233
D—TOTAL LIABILITIES (1+2+3)	*100 %*		*100 %*			
(1)Suppliers	0,00% ±	0,00%	2,04% ±	2,04%	0,243[1]	-0,221
(2)Financial Liabilities *Number of Credits*	99,04% ±	0,61%	90,86% ±	3,97%	0,198[1]	0,436
(3)Others	0,96% ±	0,61%	7,09% ±	3,50%	0,357[1]	-0,372

Source: Author's Field Work

Means are presented with a 95% of confidence level interval

1- Non homogeneous variance—Alternative parametric contrasts were also calculated (Mann-Whitney "U" for two independent samples)

**Significant at the 95% level of confidence*

4. 4 *Contrast of the Study Hypotheses*

Finally, I am going to contrast the four *Study Hypotheses* from point 3.1.2 given the data analysed.

H-1: Microenterprise interventions promote enterprise growth by contributing to net increases in enterprise income, net increases in employment at the enterprise level, and expanded resource base, and reinvestment of enterprise earnings in the enterprise.

To check *net increases in enterprise income*, I calculate a difference between *Sales* and the *Microenterprise Total Cost*—an aggregated of *(1) Cost of Goods* plus *(2) Microenterprise Expenses*. The result is the amount of monthly net profit of the microenterprise and is labelled as *Net Income*.

When contrasting the means, *Net Income* does not yield a significant difference when comparing in *t-2* (table 9). The size of the effect in *t-2* (*d*=0,252) can be considered small[7], but given the multiplicity of effects in microfinance IA—as commented in 2.2.1 when speaking about the *impact chain*—according to Cohen (1988) criteria this *effect size* is not negligible. So even though a difference is not statistically proved that, this could be a hint that the *net enterprise income* did increase in the intervention group.

The *net increases in employment* can be checked with two variables, *Number of Employees* and *Personnel Cost*. *Number of Employees* is significantly lower in the *intervention* group both in *t-1* and *t-2* which makes invalid the comparison. But when checking *Personnel Cost*, both the amount (table 9) and the share with respect to *Total Expenses* (table 10) is significantly lower in the *intervention* group. So it seems that either the individuals in the *intervention* group are firing or hiring less employers, or that they are moving from having paid to having unpaid employees (like relatives or friends). In any case, the net impact in employment seems to be negative if we consider *Personnel Cost* as a proxy variable.

7 According to Cohen (1988) guidelines, a effect size from 0,2 can be considered as small, from 0,5 as moderate, and from 0,8 as large.

In order to check if the *resource base* of the microenterprise has expanded, I calculated the sum of *Accounts Receivable (C-2), Inventory (C-3)* and *Microenterprise Assets (C-4),* and labelled as *Microenterprise Total*. This aggregated variable is not significantly different—although close to significance levels— in *t-2,* but the effect size (*d*=747) is near to be considered *large* according to Cohen's guidelines. So the impact in the *resource base* of the *intervention* group seems to be positive, expanding the resources available for the *microenterprise*. This expansion of the resource base is not big in the *Microenterprise Assets (C-4)*, but it really affects the subcategories *Inventory (C-3)* and *Accounts Receivable (C-2)*. This can be observed when checking in table 10 the shares of each subcategory in *Total Assets (C)* in *t-2*. While the effect in the share of *Microenterprise Assets (C-4)* is negative (*d*=-172), the share of Inventory (C-2) shows a positive effect (*d*=252). This means that the expansion of the resource base is made mainly by increasing the *working capital*.

In order to check the *reinvestment of enterprise earnings in the enterprise,* I calculate a difference between *Microenterprise Total*—an aggregated of *Accounts Receivable (C-2), Inventory (C-3)* and *Microenterprise Assets (C-4)*—and *Total Liabilities (D)*, labelling it as *Reinvestment*. This variable did not give any statistically significant difference, and the size of the effect (*d*=0,116) is not really appreciable. In this case, I cannot conclude that there is a reinvestment of earnings in the microenterprise, but given that the resource base seems to be expanding, this could mean that the microenterprise resource base is growing because of the credit.

H-2: Microenterprise interventions contribute to net increases in household income by increasing microenterprise income and through reinvestment of microenterprise income in other household income-generating activities.

The *increase in microenterprise income* can be measured with the variable Sales. This variable shows no significant different, although the size of the effect (*d*=201) could indicate that the income in sales of the *intervention* group has grown.

In order to check if this has as a consequence a *net increase in household income*, I calculate a difference between *Total Income (A)* and *Total Expenses (B),* and label it as *Liquidity*. In this variable I cannot find any significant difference, and the magnitudes are

almost equal in both *intervention* and *control* group. I cannot conclude that there is a *net increase in household income*.

Finally, in order to check the *reinvestment of microenterprise income in other household income-generating activities*, I checked the share of different incomes of the household with *Total Income (A)*. While there is a significant difference in *t-1* as the intervention group seem to have significantly less dependence on sales, this difference is no longer significant in *t-2*. So I cannot conclude that there is a diversification of household activities.

H-3: Microenterprise interventions contribute to household security by generating surplus income for use in the accumulation of assets.

The amount of *Household Assets* (C-5) in *t-2*, is significantly bigger in the *intervention* than in the *control* group. Even though some of the items of the subcategory were significantly different already in *t-1 — Music System, DVD, Others*—, in *t-2* also *Washing Machine* is significantly different, and the aggregated value is bigger.

I can conclude that there is an increase in the assets of the household.

H-4: Microenterprise interventions contribute to net increases in household income which leads to increased expenditures on food, education, and health, and thus economic security.

As stated in point 4.2, the main difference ex ante between both groups in *t-1* is that the intervention group spent a significantly bigger amount in *Family Expenses*, especially in *Education* , were both the absolute amount and the share of this variable with *Total Expenses (B)* is significantly bigger in the *intervention* group.

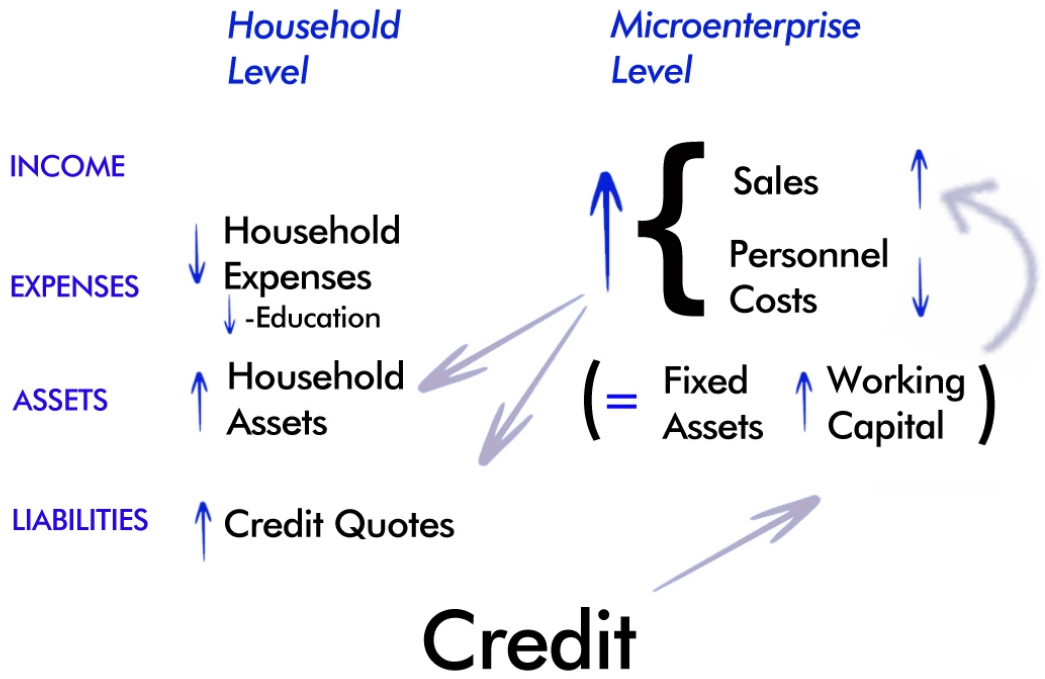
In *t-2*, both differences are no longer statistically significant. This could mean that the amount of Family Expenses has decreased during the microcredit, and this reduction was partly due to a lower amount of money spent in education.

5 CONCLUSSIONS

When contrasting the hypotheses proposed, I came with some conclusions and some statistical clues about the impact of the microcredit programme in the beneficiaries.

But in order to formulate the conclusions we have to take in consideration the limitations of this study. *Cross-sectional* analysis provides a useful tool in order to assess the impact of a microfinance programme given the time and resources limitations I had. Even though the quality of the data gathered in Bancamia was really high and allowed me to look inside the mechanics of the microcredit. But it should be taken in account that—although mostly comparable—there still were some differences between the baseline of *intervention* and *control* group, and some of the uncontrolled biases—like *endogeneity*—can distort the results as well.

While the conclusions of the four hypotheses proposed can stand on their own, I tried to make a diagram in order to connect all the conclusions.



It seems like the money of the microcredit is mostly used in order to finance Working Capital—specially Inventory—, with the probable effect of a rise on sales. This rise on sales and the decrease in Personnel Costs and the probable decrease in Household

Expenses gives the household a surplus that is directed towards the repayment of the credit but also to the accumulation of Household Assets. The fact that Households Expenses do not seem to rise but do decrease contradicts one of the most expanded suppositions about microfinance—that it helps boost the family consume, and increases the expenses in food, health or education—, but it is coherent with the results of the last randomized experiments in Microfinance in India (Banerjee *et al.* 2012), Bosnia (Ausburg *et al.* 2011), Mongolia (Attanasio *et al.* 2011) and Morocco (Crépon *et al.* 2011). In all this researches, the investment in the own enterprise did increase after the participation in the programme —unless in individual lending in Attanasio *et al.*—but household expenses were not significantly altered—the only exceptions, an increase in food spending in Attanasio *et al.*, but also a decrease in food spending in Ausburg *et al.* —.

Finally, in all these studies one of the limitations was the short period studied (12-18 months), and it should be taken in account in this research. If microfinance has different effects in the long term is a question still to be answered.

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