

Poverty reduction through micro credits?

- a study of the Un Techo para Chile micro-credit programme

The purpose of this Master's Thesis was to study a micro-credit programme in Santiago de Chile. An impact assessment of the programme was conducted, focusing on how the loan has affected its clients' income. A field study was carried out, performing a survey with over 250 individuals. These were divided into a sample (those who had received a loan) and a control group (those who had not received a loan). The data collected revealed that the sample group increased their income twice as much as the control group.

Key Words: informal finance, micro credits, microfinance, impact study, Chile.

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List of abbreviations

GDP	Gross domestic product
MC	Micro credit
MFI	Micro-finance institution, e g Grameen Bank or UTPC
NGO	Non-governmental organisation
PPP	Purchasing power parity
SIDA	Swedish International Development Cooperation Agency
SME	Small and medium enterprises
SPSS	Statistical Package for the Social Sciences
UTPC	Un Techo Para Chile
VIF	Variance Inflation Factor

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Table of Contents

1 Introduction	4
1.1 Purpose.....	4
1.2 Outline.....	4
2 Theoretical framework	5
2.1 Capital formation	5
2.2 Rationale for MC	7
2.3 Doubts about MCs to the very poor	9
2.4 What is poverty?	9
2.5 The Grameen Bank	10
3 Hypothesis	10
4 Method	11
4.1 The choice of approach	11
4.2 The choice of variable.....	11
4.3 The choice of Chile and Santiago	12
4.4 Resources	12
4.4.1 Interviews	12
4.4.2 The survey	13
4.5 Some methodological issues.....	13
5 Chile	14
6 Un Techo para Chile	15
6.1 UTPC	15
6.2 Goal and target group of micro credits.....	15
6.3 The Loan	16
6.4 The programme in practise.....	16
6.5 UTPC and the market failures	17
7 Empirical data and analysis	19
7.1 Group characteristics.....	19
7.2 Preliminary results	19
7.3 The sample - a basic econometric model	21
7.4 Women versus men.....	22
7.5 Amount of loans and hypothesis 2.....	23
8 Qualitative or quantitative?	25
9 Conclusions	26
9.1 Further research	27
10 References	28
10.1 Books and articles	28
10.2 Internet	29
Appendix A	30
Appendix B – the original survey	31
Appendix C – translated survey	32

1 Introduction

In 2006, there were over 1 billion poor people in the world, and poverty eradication is a key objective of countless organisations. Poverty has many dimensions; its causes are numerous and hard to solve. However, it is more and more acknowledged that supporting small and very small businesses is important for reducing poverty. These entrepreneurs are often excluded from formal credit markets.

In 2006, the founder of Grameen Bank Bangladesh, Muhammad Yunus, and the bank itself received the Nobel Peace Prize. The organisation was founded in 1976 (first as a research project, then formally as formal bank in 1986), and it is considered to be the first modern micro-finance institution. Over the years it has provided credit to over 4 million individuals in Bangladesh, and today there are thousands of similar organisations across the world.

In 2006, Chile had the one of the highest GDP PPP per capita in all of South America. Driven by e.g. high copper prices the economy is truly booming. At the same time Chile suffers from high income inequality, and poverty is widespread. Micro credits (MCs), defined as small loans to poor people, are not likely to affect the growth figures of Chile to any substantial degree. Nevertheless, it is crucial not to underestimate the “micro-impact” on the individual, family and community level.

In light of this I felt it would be interesting to see in what way micro credits may help the poor in Chile raise their income, and thus, hopefully, leave poverty behind. Especially interesting, and also the focus of this thesis, is the impact MCs can have on the very poorest.

1.1 Purpose

The purpose of this thesis is to study a micro-credit programme in the area of Santiago de Chile and, more specifically, try to estimate the impact it has had on the income of the clients.

A sub question is: did initial income level affect the impact? In other words, is there a correlation between initial income and the success of micro credits? Is the correlation negative or positive?

1.2 Outline

The section *Theoretical framework* attempts to consider the possible linkages between micro credits and development/poverty reduction. This is followed by a presentation of the *hypothesis* and the *method*. Before analyzing the studied micro-credit programme in the section *Un Techo para Chile*, a very short summary is made of Chilean contemporary history

and the country's economic and social situation. Thereafter, the *empirical data* from the survey is presented, followed by a short *qualitative* part. The study ends with *conclusions*.

2 Theoretical framework

The purpose of this chapter is to discuss the theoretical framework of micro credits. The main focus will be on the (possible) connection between micro credits and development/poverty reduction, but a few words on poverty and the Grameen Bank are also included.

2.1 Capital formation

Standard economic growth theory, for instance the Solow model based on the Cobb-Douglas function, suggests that capital formation is one of many factors creating growth. The financial system, by accumulating investment capital, plays a crucial role in this process.¹ Empirical evidence shows that the relationship between financial development and growth is a positive one, even if it is far more complex than expected.² Less is known about the relationship between financial development and poverty reduction. Julian and Kirkpatrick identify two links.

Firstly, indirectly: financial development increases economic growth, which in turn affects poverty reduction. However, "...the positive impact of financial development on poverty reduction will be adversely affected by a change in income inequality resulting from financial development."³

Secondly, through the mechanisms illustrated in figure 1:

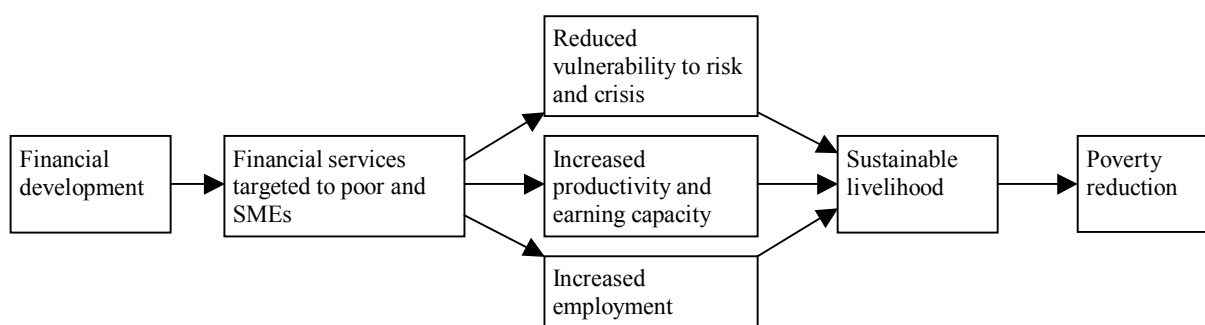


figure 1⁴

The thesis aims at studying this second link, when financial services targeted to poor help reduce vulnerability to risk, and increase employment and productivity. Even though MCs

¹ Carmichael (2002).

² Julian and Kirkpatrick (2005), Carmichael (2002).

³ Julian and Kirkpatrick (2005).

⁴ The figure is an adaptation of similar one in Julian and Kirkpatrick (2005).

probably do not affect the growth of countries substantially, since the loans are so small, they have proved to be an important tool in lifting people out of poverty. Stern argues that an important part of development is just that, to make it possible for poor people to participate in economic life, to be able to shape their own future.⁵ This can be related to the well known vicious circles of Nurkse⁶ (figure 2):

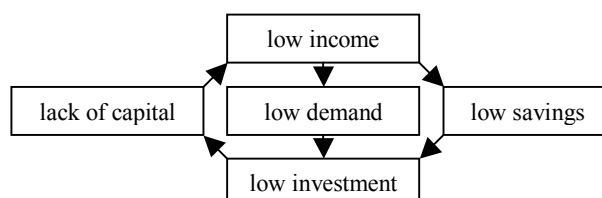


figure 2

One way to break this situation could be with an inflow of capital, for instance in the form of a micro credit. This leads, hopefully, to successful investment, which in turn leads to higher income. Repaying the first loan, which has led to a higher income, increases creditworthiness, allowing a larger micro credit. This continues until, as is the objective of many micro-finance institutions (MFIs), including UTPC, the borrower can obtain a traditional bank loan (figure 3).

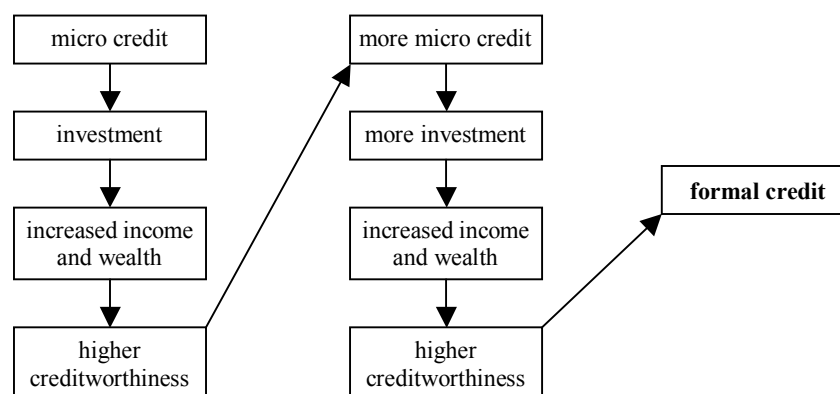


figure 3

In spite of this, according to Shane, credit alone is no panacea, and it can even be harmful. The execution phase of a new enterprise/project consists of three important parts: resource assembly, organisational design and strategy.⁷ In other words, availability to capital is not enough. Credit programmes that only include “cash” and not advice/training on how to create or expand an enterprise are less likely to work. Many (MFIs) offer their clients such training.

⁵ Stern (2005).

⁶ See for instance Lundahl (1987), p 58.

⁷ Shane (2003).

UTPC demands that their clients participate in such training in order to be eligible for a loan (see further section 6.4).

2.2 Rationale for MC

People lacking capital need credit to invest. High transaction costs, adverse selection, moral hazard, and lack of functioning legal institutions are just some of the problems (market failures) that creditors and borrowers face in developing countries. Add to this asymmetric information, which generally means that the borrower has an information advantage: he knows more about the true risk involving the project (for which he seeks money), as he knows more about his credit status.

Even though most people would claim that Chile has functioning legal institutions, and thus creditors can penalize a borrower who does not keep his part of the bargain, this is of less importance in the case of MCs. Firstly, the judicial cost probably would exceed any expected gain.⁸ Secondly, expected gains could equal zero since the borrowers in question have no collateral, and incomes below the standard poverty line of 2 US\$ dollars per day, or slightly above. In total, all this makes it very costly for formal creditors to give loans to poor people.

The option then, is for the borrower to turn to the informal credit market. Family and friends constitute an important part, probably the most important one.⁹ Another group consists of the moneylenders, who can compete with banks because they have an information advantage over the latter, and/or social/family ties, which reduce risk.¹⁰ Murinde claims that the moneylenders occupy a monopolistic position, thanks to their information advantage, and thus are able to extract monopolistic rent.¹¹ Hoffa and Stiglitz, on the other hand, argue that information and enforcement costs explain, to a high degree, the interest rate.¹² Lundahl puts emphasis on the preference of the borrower, who values present income much higher than future.¹³ The truth, as Montiel maintains, is probably somewhere in between these varied theories.¹⁴ Either way, leaving aside this undecided discussion, the fact is that moneylenders charge a very high (and sometimes illegally high) interest rate.

It is hard to measure the extent of the informal market. Montiel, recognizing that the estimates are highly insecure, in a study of ten Asian countries, shows that the share of the

⁸ Hayami (2001).

⁹ Adams (1992).

¹⁰ Gillis (1992).

¹¹ Murinde (1996).

¹² Hoff and Stiglitz (2002).

¹³ Lundahl (1974), pp 213-235.

¹⁴ Montiel (1993).

informal credit varies between 33 and 76 %.¹⁵ Either way, the demand for credit is high, forcing people to turn to the informal sector or, more likely, refrain from investing at all. However, this need not be so. The problems mentioned above have (at least partial) solutions, solutions that MFIs can use; a summarized description of these is given in table 1 below. The blank spaces in the right column will be filled in section 6.5.

Table 1: market failures in the financial markets some possible solutions

market failure	Problem	possible solution	Chile / UTPC
legal system	no enforceability when default	property rights (of land) non-traditional collateral	Chile has relatively developed legal institutions. However, the poor borrowers do not own any collateral.
high transaction costs (t-cost)	small loans increase the relative t-cost ¹⁶	improve credit practises	
	high t-cost for clients because of geographic distance (having to go to a city)	mobile banking	
information & technology	little R&D on financing of the poor	more MFIs create more knowledge/experience	
asymmetric, or lack of, information	creditors lack info on borrowers credibility	delegation of screening and enforcement	
		peer monitoring through group lending ¹⁷	
		create a black list with people who have defaulted on their loans	
		small first time loans decrease loss and gives info concerning borrower creditworthiness for the future ¹⁸	
	creditors lack info on project risk	monitor and provide training gives info about project risk and decreases the same risk	

Source: in part based on appendix 1 in Spencer (2005).

One final point in this section: borrower transaction costs are, in relative terms, more burdensome for small enterprises.¹⁹ Why? Assume that the cost of obtaining a loan (in travel time, filing applications etc) is X pesos. Assume further that X does not differ depending on loan size (at least up to a certain point) or only differs slightly. Then the relative transaction

¹⁵ Montiel (1993).

¹⁶ Stallings (2000).

¹⁷ Borrowers getting loans together creates what Shane (2003) denotes social ties. However, these ties are not only positive for the borrower, since it puts pressure on him/her to repay the loan.

¹⁸ Adams (1992). However, this entails an obvious trade-off for the creditor. Small loans increase transaction costs. However, at the same time they decrease risk of default, default amount, and the borrower has incentive to repay the loan. Doing so makes him/her eligible for a higher loan.

¹⁹ Stallings (2000).

cost is affected inversely by the size of the loan. The smaller the loan, the higher the relative transaction cost. Murinde confirms this showing that the ratio of borrower transactions costs to loan size is dependent on the size of the loan. The ratio decreases when loan size increases.²⁰ He also shows that informal borrower transaction cost is (at least) ten times lower for the smallest loan than the formal one. Also, a study by Schneider, suggests that MFIs can reduce borrower transactions costs by up to 85 % by improving practices and going out to the borrower.²¹

2.3 Doubts about MCs to the very poor

Some studies have shown that substantial income increases are more likely to occur in case of moderately poor, when the micro credit breaks a threshold level. Even so, if increases in income are low, or even non-existent, other research has shown that (at least) micro finance programs lead to consumption smoothing. This renders it possible for poor households to attempt longer-term strategies, strategies that without smooth consumption would be regarded as too risky. Also, MCs have shown to increase nutritional intake and children school attendance. Another dimension where MCs have a large impact is in empowering women.²²

2.4 What is poverty?

Poverty is a concept with many definitions, many dimensions, ranging from education to nutrition, from health to income, from unemployment to marginality.²³ The World Bank defines poverty as the inability to attain a minimal standard of living. Stern claims that to reduce poverty it is essential to support the small enterprises, since it is here that most poor people make their living. Empowerment, defined as “having the ability to shape one’s life”, consists of participation in the economy and society and, not the least, in the form of access to credit at fair rates.²⁴ Empowerment is similar to the concept of ‘capability’ or, as Sen would have put it, entitlement.²⁵

González (2000:265) discusses survival strategies of the urban poor and comes to the conclusion that survival to a high extent depends on the “...ability to establish relationships and create contact nets with the surrounding milieu.” These nets, family, friendships are what make it possible to survive a crisis, find a job, etc. In other words, poverty in urban Chile is not individual, but collective, seeing as the whole net helps out when someone is poor.

²⁰ Murinde (1996), p 86.

²¹ McGuire and Conroy (1997).

²² Kanbur and Squire (2001).

²³ Reyes (1992).

²⁴ Stern (2005).

²⁵ Sen (1987).

Here just a small introduction to concepts of poverty was given, with the intention of linking this to the possible role of MCs in poverty reduction: providing empowerment, income, capability; in creating social- and human capital; in giving people a chance to create a future for them.

2.5 The Grameen Bank

Thousands of MFIs operate around the world, all with different methods. The most well-known is Grameen Bank. In 1976 professor M Yunus started a credit project, giving credit without collateral to rural poor. What started as a small scale project reached 3.7 million borrowers in 2004. The organisation claims that the percentage contribution of Grameen bank to Bangladesh GDP (in 1994) was 1.50 %.²⁶ Doubts have been cast as to the sustainability and success of the Grameen bank. For instance, Kanbur and Squire show that Grameen would need to raise the interest rates to 33 % in the absence of subsidies.²⁷ However, most researchers recognize that Grameen Bank has had a positive impact on the situation of the poor, and especially that of the women.²⁸

3 Hypothesis

Developing countries are in general undercapitalised. Even though this is perhaps not true for Chile in general, it is so for many Chileans. Capital is a scarce factor; it is a factor they do not have access to. If capital and training is given, it is likely that production and income increases, and more so than for those who do not receive credit.

H1: Ceteris paribus, those who received micro credits increased their income more than the control group (who did not receive a credit).

The second hypothesis addresses the issue whether the initial income level affects the impact of MCs. As mentioned earlier, some studies have shown that income increases are more likely to take place in the case of the moderately poor, because the loan has to break a certain threshold level. On the other hand, it seems plausible that lower initial income means a stronger impact, since any capital inflow would be substantial. The first loan is fixed at a maximum of 50,000 pesos, a sum that roughly equals two monthly salaries for the very poor. Obviously this gives the borrower investment possibilities he would not have had otherwise.

²⁶ <http://www.grameen-info.org/bank/contribu.html>.

²⁷ Kanbur and Squire (2001); for the sustainability of Grameen Bank, see also Hossain (1988).

²⁸ Hossain (1988), Olofsson, (1993).

Thus, it seems more likely that there is a positive correlation between lower initial income and increased income.

H2: Ceteris paribus, individuals with a lower income before the loan experienced a higher increase in income than those with a higher income.

4 Method

The purpose of this chapter is to discuss the methodology used in this thesis.

4.1 The choice of approach

Table 2 summarizes some different impact assessment approaches that could have been used.

This thesis tries to measure the micro impact of micro credits using a quasi-experimental approach; in other words: to “compare the outcomes of an intervention with a simulation of what the outcomes would have been, had there been no intervention”.²⁹ More specifically, a **survey** was taken to study differences in means of income between a large sample of borrowers (treatment group) and non-borrowers (control group).³⁰ However, even though the focus was on a quantitative approach, some **in-depth**

Table 2: Summary of different impact assessment approaches, categorized by type and level:

	Micro level	Meso level	Macro Level
Experimental			
Quasi-experimental	X		
Qualitative, non experimental	(x)		
Participant-oriented			

Source: SIDA (2004), pp 7-10.

interviews were also carried out and information from these will be used in the thesis.

4.2 The choice of variable

The purpose of this thesis is to study the impacts on poverty of a micro-credit programme. Of course, as discussed earlier, poverty has many different dimensions. It is reflected in many different groups of variables, for instance: income, employment, health, education, consumption, and net worth of the household. Obviously, all of these only show parts of poverty, and all of them entail certain problems. Income was chosen mainly because

- it is a variable relatively easy to measure
- some of the other variables, like health or education, are more likely to be affected in the long run, and this study investigates the outcome just one year after the loan.

²⁹ SIDA (2004), p 8.

³⁰ SIDA (2004), p 32.

4.3 The choice of Chile and Santiago

Chile was chosen on the basis that it economically is one of the fastest growing countries in South America. Its GNI/capita (PPP) surpassed that of e.g. Brazil in 1992 and Mexico in 2005.³¹ Most micro-credit studies focus on low-income countries and there seems, to the authors' knowledge, to be a shortage of studies on medium-income countries like Chile.

Likewise, studies on rural micro-credit programmes are in abundance, while there are few or very few studies of non-rural programmes, especially in Chile. This is one of the reasons why Santiago de Chile was chosen. Another reason was the geographic nature of Chile: it stretches 4000 km from north to south, making travel costly and time consuming. Of course, this limits the validity of the thesis, since the settlements of Santiago face other realities than those of other parts of Chile. It is estimated that at least 4-5 million people live in Santiago, and migration to the metropolis continues, creating large unique agglomerative forces, which could act both as advantages and disadvantages for enterprises.³²

Finally, the organisation Un Techo para Chile (UTPC) was selected on the basis that it targets the poorest, even more so than Hogar para Cristo and Grameen Chile, two other Chilean MFIs.

4.4 Resources

The thesis, apart from relevant literature (some already discussed above), was based on two pillars: interviews and a survey, the focus being on the latter.

4.4.1 Interviews

Firstly, staff of UTPC was interviewed in order to acquire an understanding of their MCs programme.

Secondly, general interviews were carried out with randomly selected people (borrowers and non-borrowers) living in settlements, the purpose of which was to obtain an overall picture of their situation.

Thirdly, the questionnaire for the survey was created (see 4.4.2 below). In combination with the survey, several borrowers were interviewed in-depth in order to deepen the understanding of the survey.

Staff of UTPC were never present during interviews borrowers or non-borrowers, since their presence could have affected the sincerity of the answers. During all interviews it was emphasized that total anonymity was guaranteed.

³¹ <http://devdata.worldbank.org/dataonline/>.

³² For studies of migration to Santiago de Chile, see Herrick (1965), and González (2000).

All interviews were carried out in Spanish without an interpreter. Since the author of this study speaks Spanish fluently, the risk of misunderstanding was low.

4.4.2 The survey

A preliminary questionnaire was worked out in cooperation with UTPC. This was tested on a few persons to check for any problems. Some minor issues were thereafter modified. The survey, both the original in Spanish and a translated one, can be found in appendix B and C.

Thereafter a random sample of borrowers (also referred to as treatment or control group) was made and interviewed. During this process the same questions (except the questions regarding the loan) were asked to a large control group. 14 different settlements were visited (see appendix A, table 13 for a list) during two months.

Finally the information was coded and analysed, using mostly SPSS and Excel.

4.5 Some methodological issues

There are several methodological difficulties related to the issue of micro-credit impact assessments, below are just a few.³³

- Fungibility: it is hard, if not impossible, to measure if the borrower, or someone else, uses the loan, and for the purpose specified.
- Attribution: there is always a risk of (falsely) attributing specific effects to specific causes, that is, for instance: attributing an increase of income to a micro credit.
- Non-random programme placement: that is, the micro-finance organisation places its programme in locations with specific conditions that affect the success or failure of the programme. In this specific case the risk of this is low since the thesis will observe a micro-credit programme in several separate areas of Santiago de Chile.
- Non-random participation: that is, the people acquiring loans share certain characteristics that differ from the non-lenders, for instance entrepreneurial skill, a characteristic that could be the main reason for the increase in income, and not the MC. In other words, even if there is a significant difference between the treatment group and the control group, the difference may be caused by inherent characteristics in the treatment group, that is, they would experience an increase in income even without the loan.

³³ SIDA (2004), p 7.

5 Chile

The purpose of this chapter is to give a very brief summary of Chile, its contemporary history, the economic policies pursued during the three last decades; and the economic and social status today.

Following Salvador Allende's victory in the elections in Chile in 1970, his government began a transition from capitalism to socialism. It realized several reforms that gave the state more power over the markets, and nationalized certain areas of the economy (among them the copper mining industry). These reforms were partly responsible for the large economical crisis in 1973. The same year a coup d'état took place, and Chile became a dictatorship under general Pinochet and the military. In 1975, the military regime began to implement, on the recommendation of a group of economists known as the Chicago Boys, a very liberal economic model, based on free markets and the privatisation of public enterprises.³⁴ The results were promising until 1982, when the rise in the price of petroleum affected the Chilean economy heavily. Chile suffered an economic crisis worse than that of 1973.³⁵ Some minor modifications were made to economic model, and two years later the economy began to grow rapidly again.

Democracy came in 1990 with the withdrawal of Pinochet. Due to the positive economic results achieved during the military regime, the new government did not alter the economic policy to any substantial degree. Economically the country fared well, but the social problems were becoming more and more evident. Chile was one of the most unequal countries in the world, and poverty levels were high.

Eventually, more and more social reforms have been implemented in Chile in order to come to terms with the social problems. Life expectancy is now the highest in Latin America, poverty is slowly declining³⁶ and the gap between the income ratios of the richest and the poorest 20% of the population has declined from 20:1 to 10:1.³⁷ Nevertheless, the situation for the very poor has not improved to any substantial degree, and although Chile now is a net

able 3: Chile - short facts

Population:	16,3 million (2005)
Area:	756,000 sq. km
Capital:	Santiago de Chile
Life Expectancy	78,0 (2004)
GDP/capita	10,874 US\$ (2004)
Population below national poverty line	17 % (2003)

Source: World Bank and UNDP (2006).

³⁴ Huneus, pp. 389-427.

³⁵ Ibid, pp. 437-485.

³⁶ <http://www.fundacionpobreza.cl/archivos/indicadorespobreza.pdf>.

³⁷ UNDP (2005).

provider of international aid, it has problems providing for its own poor. Almost 20 % of the population has incomes below the national poverty line.³⁸ The state action has not reached the young, the rural population, one-person female households etc.³⁹ French-Davis (2002) highlights six approach points which would reduce poverty and increase income equality in Chile. Two of these are concerned with the SMEs, and their need of increased “access to long-term domestic financing”.⁴⁰

6 Un Techo para Chile

The objective of this chapter is to describe and analyze the organisation ‘un Techo para Chile’ and, more specifically, its micro-credit programme.

All the information in this chapter is based on information from UTPC and personal observation, if not stated otherwise.

6.1 UTPC

Un Techo para Chile (literally: a roof for Chile) is a non-governmental organisation (NGO) mostly consisting of young volunteers. They provide poor people with education, legal counselling, micro credits and housing. The latter constitutes, by far, the largest part of the UTPC operations; each year about 20,000 volunteers collect money and material and construct or improve existing houses. Micro credits constitute a very small part of UTPC activities (in 2006, in the field of MCs, the organisation had 3 employees and 84 volunteers working with MCS), but it is a sector growing considerably each year.

6.2 Goal and target group of micro credits

The un Techo para Chile micro-credit programme targets people living close to, above or below, the poverty line and who are in need of credit in order to expand or start an enterprise.

The general goal of the programme, to improve its’ clients’ life quality, is operationalized through three sub-goals:

- to increase the income of the clients
- to (in the long run) help the clients receive a formal bank loan
- to develop and/or improve their entrepreneurial skills

³⁸ UNDP (2005), p 227.

³⁹ French-Davis (2002).

⁴⁰ French-Davis (2002).

6.3 The Loan

UTPC offers three (or sometimes four) types of credit.

1. **Group credit with group repayment** (one bill). Groups consist of 3 to 7 persons. Loans are given to each person in the range of 30,000 to 50,000 pesos per person. On the 3rd of April 2007, 1 Swedish krona was equivalent to 77 Chilean pesos, 1 Euro was 721 and 1US\$ 540.⁴¹ Each member is liable for the debts of the others. The loan time is eight weeks, and repayment is on a weekly basis.
2. **Group credit with individual repayment** (each member receives a bill). Groups consist of 3 to 7 persons. Loans range from 30,000 to 85,000 pesos per person. Each member is liable for the debts of the others. The loan time is eight weeks or more, and repayment is on a weekly basis.
3. **Individual credit.** Loans are up to 150,000 pesos. The loan time and the repayment rate vary.

In order to be entitled to the second loan the client needs to repay the first one, and so on.

The effective interest rate is between 1-2%. The low rate indicates that its' main purpose is educational.

6.4 The programme in practise

The activities in the Santiago area take place in Campamentos, “[g]roup[s] of ‘dwellings’ for the urban poor established after an organized taking of land, public or private.”⁴² In the future the term “settlement” will be used.

Volunteers go to the settlements and inform about the programme. Interested individuals are instructed to form groups of 3-5 persons. This is, except on some occasions, required to be eligible

In 2005, 41 % of the population in the settlements, where UTPC were active, lacked electricity, 54 % did not have access to clean water and 93 % were in need of sewage systems.

for a loan. The group members are jointly responsible for the debts of the other group members. However, it seems that UTPC in no case has exercised this right. It is possible to ask whether this is a viable strategy for the future, especially if the repayment rate should drop.

Once the groups are formed, several meetings are held with the group members and representatives from UTPC. The purpose is to assess the project for which the clients seek a loan and provide individually based education, ranging from basic marketing to accounting.

⁴¹ <http://fxtop.com/>.

⁴² Gonzáles (2002).

Just to give a short example: the third meeting normally is focused on a “market study”. The volunteers give a brief lecture, and encourage the clients to consider questions like “who are my competitors?”, “what can I do to attract more costumers?”, “what are my weaknesses/strengths?” etc. The clients are also recommended to do a field study, where they look up at least three competitors and investigate price, location etc.

Following these pre-loan meetings, the clients fill out a formal loan application. These are generally approved, as long as the client has participated in the pre-loan meetings.

During the loan period, each week, the clients are visited by volunteers who are responsible for providing further training/education and to collect instalments on the loan.

6.5 UTPC and the market failures

Recall table 1 in section 2.2. Table 4 below is the same table but now the right column has been filled; to show how the UTPC tries to handle the market failures discussed earlier.

The high transaction cost for the borrower is lowered because UTPC goes out to the settlements. This not only reduces the geographic cost but also the time needed to acquire information about the process of receiving a loan. Sometimes it is easy to forget, especially when living in a country like Sweden, that information is not always that easily accessed. Of course, seeking out the clients increases the transaction cost for UTPC. On the other hand, the presence of UTPC in the settlements decreases the problem of asymmetric and/or lack of information. Another way to handle this problem is through peer-monitoring; demanding that the borrowers form groups shifts some of the risk and monitoring costs onto them.⁴³ Giving only small loans to first time borrowers further decreases the risk, as does the obligatory training, which not only improves the borrowers’ business skills, but lets the organisation collect information about the project for which he/she seeks money.

The problem of information and technology is not solved on an organisational level. On the other hand, it is likely that, at least to some extent, the experience and knowledge UTPC has from working with poor people helps them with their micro-credit programme.

⁴³ See Stiglitz (1990) for a detailed discussion on peer-monitoring.

Table 4: Market failures in the financial markets: some possible solutions

market failure	problem	possible solution	Chile / UTPC
legal system	no enforceability when default	property rights (of land) non-traditional collateral	Chile has relatively developed legal institutions. However, the poor borrowers do not own any collateral.
high transaction costs (t-cost)	small loans increase the relative t-cost ⁴⁴	improve credit practises	
	high t-cost for clients because of geographic distance (having to go to a city)	mobile banking	The representatives of UTPC go out to the settlements, decreasing the t-cost for the clients, but increasing their own t-cost.
information & technology	little R&D on financing of the poor	more MFIs create more knowledge/experience	UTPC can take advantage from experience gained working with the poor in other projects.
asymmetric, or lack of, information	creditors lack info on borrowers credibility	delegation of screening and enforcement	UTPC going to the settlements creates certain ties, and makes it possible to receive info about borrowers.
		peer monitoring through group lending	UTPC demands first time borrowers to join groups of at least 3 persons (each member is liable for the others debts).
		create a black list with people who have defaulted on their loans	Default stops future loans with UTPC.
		small first time loans decrease loss and gives info concerning borrower creditworthiness for the future ⁴⁵	UTPC first loan does not exceed 50000 pesos. The borrower knows that in order to get second (higher loan) he/she must repay the loan. This lowers the moral hazard.
	creditors lack info on project risk	monitor and provide training gives info about project risk and decreases the same risk	UTPC demands that their clients participate in training in order to be eligible for a loan. This gives UTPC a possibility to accumulate information about the project risk.

Source: in part based on appendix 1 in Spencer (2005).

⁴⁴ Stallings (2000).

⁴⁵ Adams (1992).

7 Empirical data and analysis

In this chapter I continue to present and analyse the empirical findings of the study; now the focus is on the quantitative data collected using the survey.

7.1 Group characteristics

The purpose of this section is to examine the characteristics of the sample and the control group in order to establish if they are comparable. This is, of course, essential in order to establish if the loan is the key reason behind the income change.

Table 5: Summary of group characteristics:

Group	Sample Group (N=87)	Control Group (N=192)
Mean income before loan	40579	37459
Median income before loan	40000	36000
Age (mean)	35,7 years	36,2 years
Number of children (mean)	2,2	2,3
Schooling (mean)	7,6 years	7,5 years
Percentage women	81,6 %	81,3 %

Source: own survey.

Table 5 shows a summary of the variables measured in the survey. As can be observed, there is no significant difference between the two groups as to age, number of children or schooling. Neither should sex be an issue since the percentage women in the two groups is almost identical.

However, income before loan (both mean and median) differ between the sample and the control group, to such an extent (about 10%) that it could influence a comparison. See section 7.5 for more on this.

Apart from above characteristics, I tried to maintain the ratio between sample and control group in all the visited settlements. That is: if, for instance there were 15 borrowers to be interviewed in the settlement of “Puente Alto” roughly twice as many non-borrowers were interviewed.

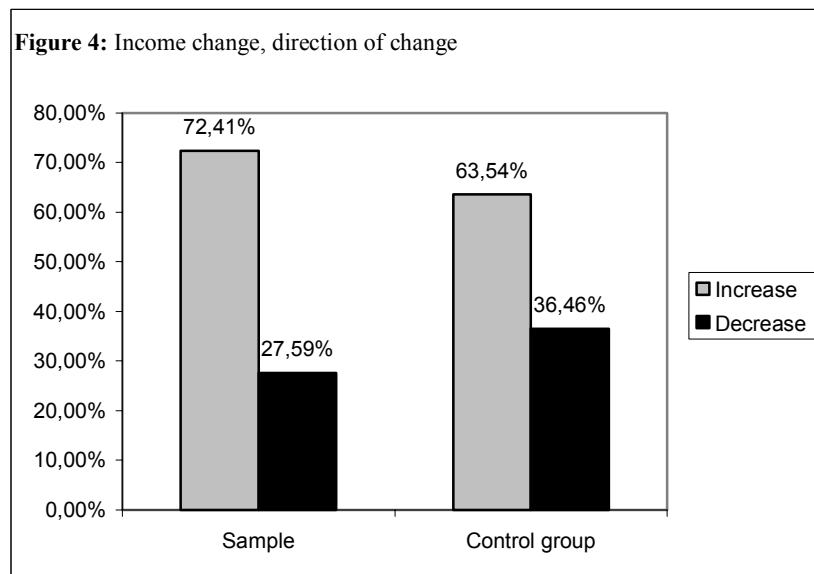
7.2 Preliminary results

Recall the principal hypothesis: *Ceteris paribus, those who received micro credits increased their income more than the control group (who did not receive credit).*

A quick calculation of the data collected in the survey affirms the hypothesis. The sample group increased their income on average by 1,800 Chilean pesos (4.40 %), whereas the control group increased it by only 700 (1.88 %). Of course, all figures here and below are

corrected for inflation. Using confidence intervals for the two means it is possible to state that, on a 95 % level, the mean income change is higher for borrowers than for non-borrowers.

There is of course also the question of breadth. The observed change in income could be attributed to a few persons increasing or decreasing their income to a high extent. To test for this several methods can be used. One simple way is to see how many have seen their income increase and vice versa.



Source: own survey.

As can be seen in Figure 4, almost $\frac{3}{4}$ of the sample population (72 %) experienced positive income changes, compared to 64 % for the control group.

Another method to avoid the problem of a having a few observations affecting the result is to remove any possible outliers. Excluding observations that were ± 2 standard deviations above or below the mean gave the results depicted in table 6. The two observations excluded in the sample group did affect the result to a high extent (4.4 % dropped to 3.77 %), but the difference between the sample and the control group is still significant. Again, confidence intervals (95 % level) confirm this.

Table 6: Change in income, with and without outliers:

Group	Sample Group	Control Group
All observations	4.4 % (N=87)	1.88 % (N=192)
Excluding outliers	3.77 % (N=85)	1.85 % (N=187)

Source: Own survey.

7.3 The sample - a basic econometric model

In order to further understand the mechanisms behind the income change in the sample group, I chose to create a basic econometric model based on the variables collected in the survey. The OLS specification is:

$$\Delta Inc_i = \beta_{1i} + \beta_{2i} * Age + \beta_{3i} * Children + \beta_{4i} * Sex + \beta_{5i} * Education + \beta_{6i} * Loans + \beta_{7i} * Inc_before + \mu_i$$

where the percentage change in income is determined by *age*, *number of children*, *sex*, *years of schooling*, *amount of loans* and *income before the loan*. All are straightforward, except *amount or loans* which might require a few words. Some of the persons in the sample received their first micro credit during the studied time period. Others received their second or third loan. It is plausible that the amount of loans received affects the impact of the last one, since

- a) to receive a second loan the first must be repaid
- b) the second and third loans are bigger.

The R^2 value of this model is only 0.296, which is quite low. However, the goal is not to create a model that explains the income change entirely, but rather to use the econometric model as a channel to study the variables collected in the survey; a starting point, which might guide the further direction of the analysis.

Table 7: Sample group - expectations and results of the regression

Group	Expected coefficient	Estimated (unstandardized) coefficient using the model	Significance
<i>Age</i>	+/-	- 0.163	.086
<i>Children</i> (number of)	-	- 0.785	.140
<i>Sex</i> (female=1, male=0)	+/-	1.377	.430
<i>Education</i> (years of)	+	0.998	.042
<i>Loans</i> (amount of)	+	6.955	.000
<i>Income before</i>	+/-	- 0.00029	.037

Source: own survey.

Table 7 shows the expected values (positive or negative) of the coefficients, the estimated coefficients given by the regression and their significance.

Age is significant on a 10 % level, with a negative coefficient. Each year reduces the percentage change in income by 0.163. One reason for this could be that older people have more children/responsibilities and can not fully take advantage of the loan.

The number of *children* has a considerable effect on income change, which is understandable. The majority of the sample (80 %) are women, and more likely to stay at home taking care of the children, which limits their possibilities of creating and/or expanding an enterprise, especially in a country as Chile. The variable is not significant on a 10 % level.

Sex is even less significant, but see also section 7.4.

Education on the other hand is highly significant, and each year of schooling raises the change in income with almost one percentage. This is to be expected.

The *amount of loans* is clearly significant and the coefficient is very high. This will be studied more profoundly below in section 7.5.

Income before the loan is also significant on a 5% level, and the negative slope indicates that the loan actually has a higher impact on lower income levels. This will be studied further in section 7.5.

Since the econometric model is just a small part of this thesis, only a few of the normal evaluation tests for an econometric model are performed. To test for heteroscedasticity scatter plots for each explicatory and the dependent variable were constructed. The graphs did not show any major risk of heteroscedasticity. To save space, these were not included, but are available on request.

Neither seems multicollinearity to be a problem. A high Variance-inflating factor ($VIF > 10$) would have indicated that a variable is collinear. Table 8 shows that the VIF-values for all the explaining variables are low. Furthermore, no correlation between coefficients was above 0.5 (see table 14, appendix A), which indicates that the level of multicollinearity is low.

Table 8: VIF factor for each explaining variable

Variable	VIF
Age	1.01
Children	1.02
Sex	1.02
Education	1.03
Amount of loans	1.20
Income before	1.22

Source: own survey.

To summarize section 7.2 and 7.3: the data seems to support the first hypothesis; that income change was more positive for the persons who received a loan compared to those who did not.

7.4 Women versus men

The basic econometric model above indicated that sex is insignificant on any acceptable level. On the other hand, the coefficient is quite high (+1.377), indicating a substantial difference between men and women. Therefore the issue may need further investigation.

Table 9 below shows a comparison of averages for men and women. As can be observed, there is no significant difference between the two groups as to mean income, age or number of children. The difference between median incomes could be explained by the fact that the male

group only contains 16 individuals, and should not matter much since the mean incomes are similar. The only real divergence between the two groups is therefore years of schooling.

Table 9: Comparison between men and women in the sample.

Group	Women (N=71)	Men (N=16)
Mean income before	40,610	40,444
Median income before	40,000	37,000
Age (mean)	35.6 years	36.5 years
Number of children (mean)	2.3	2.0
Schooling (mean)	7.5 years	7.9 years
Percentage women	81.6 %	81.3 %

Source: own survey.

The slight difference in education suggests that men should have potential to increase their income more. A quick glance at the results in table 10 below both strengthens and weakens this. When all observations are used, the average for men is 1,3 % higher than that of the women. When excluding outliers (1 for men, 2 for women), the situation changes. Now, women have a higher average income. Thus, it seems that there is no difference between men and women. All conclusions in this section should be taken with caution, since there are only 16 men (15 excluding the outlier).

Table 10: Average change in income, divided by sex:

	Women	Men
All observations	4.1 % (N=71)	5.4 % (N=16)
Excluding outliers	3.6 % (N=69)	3.4 % (N=15)

Source: own survey.

7.5 Amount of loans and hypothesis 2

Section 7.3, where the basic econometric model and its results were described, clearly showed that the coefficient *amount of loans* had a strong positive influence on the income change. The coefficient *income before* was also significant and had a negative influence.

Table 11 below tries to investigate this further. Here the sample is divided according to how many loans each person has received from the organisation. There seems to be a clear correlation between the number of loans and the income change. Recall that the first loan ranged from 30,000 – 50,000 pesos, the second 30,000 – 80,000, and the third: up to 150,000. More capital could prove to have a larger impact. However, the table also suggests a positive

correlation between average monthly income before and income change, that is, contrary to the econometric model.

Table 11: Change in monthly income, sample group, sorted by amount of loans.

Group of debtors	Average monthly income 'before'	Average income change	Average income change, excluding outliers
Debtors: 1 st time (N=49)	37,029	2.7 %	no outliers
Debtors: 2 nd time (N=32)	44,313	4.6 %	no outliers
Debtors: 3 rd time (N=6)	49,667	16.8 %	10.5 % (N=4)
All debtors (N=87)	40,579	4.4 %	3.8 % (N=85)

Source: own survey.

In order to look more into detail, in table 12, the debtor groups are divided into smaller groups according to monthly income before the loan. Essentially, the 50 % with the lowest monthly income form the group “Low” and the 50 % with the highest the group “High”.

Table 12: Change in monthly income, sorted by amount of loans and low/high monthly income before.

Amount of loans	Monthly income group	Average monthly income 'before'	Average income change	Average income change, excluding outliers
Debtors: 1 st time (N=49)	Low	33,296	2.75 %	no outliers
	High	40,916	2.66 %	no outliers
Debtors: 2 nd time (N=32)	Low	41,563	6.08 %	no outliers
	High	47,063	3.05 %	no outliers
Debtors: 3 rd time (N=6)	Low	44,333	22.96 %	10.3 %
	High	55,000	10.55 %	no outliers
All debtors (N=87)		40,579	4.4 %	3.8 %

Source: own survey.

The table clearly supports the findings of the econometric model; *income before* is indeed negatively correlated with income change, although with slight variations. In the group with 1st time debtors, the difference between the “Low” and the “High” group is not significant. The difference within the 3rd time debtors is also negligible when outliers are removed from the analysis.

The real divergence is in 2nd time debtor group, where “Low” increased its income twice as much as “High”. Why? Several interviewed persons indicated that the first small loan helped them to start or expand their enterprise, but that they didn’t have enough working capital, especially since they had to repay the loan in such a short time (normally 8 weeks). It is possible that the “low” group suffers more from this capital restriction since they have a

lesser monthly income, and then, when they receive the loan, experience a higher income increase. Of course, this only partly explains the phenomenon.

To summarize section 7.5: recall the second hypothesis: *Ceteris paribus, individuals with a lower income before the loan experienced a higher increase in income than those with a higher income.*

Both the results of the econometric model and table 12 support the second hypothesis.

8 Qualitative or quantitative?

Quantitative methods (like the sample survey used in this study) have several advantages. The data can be coded and examined using statistical tables or regression analysis. The methods normally have a high degree of rigour, and allow quantitative estimates of the impact. In general, the findings are more convincing to outsiders. Unfortunately these methods are often costly and suffer from time lags. They are also restricted to impact indicators that are measurable. Another difficulty is to counter the problem of selection bias. Finally, the methods reveal little about the direction of causation between observed variables.

Qualitative studies, using for instance semi-structured narrative interviews, on the other hand offer a higher richness in detail. They also offer a deeper understanding of differential impact, thanks to their ability to discover immeasurable and/or unexpected impact. Although this thesis has used a quantitative approach, several in-depth semi-structured interviews have been performed with borrowers (on my or their initiative). Even though these interviews have been conducted in a somewhat chaotic manner, it would be a shame not to mention at least some of the general (speculative) findings they gave rise to.

Apart from sharing many recipes most interviewees openheartedly told me about their lives and the impact the loan had on it. It was interesting to see how many acknowledged the fact that the loan in itself had not increased their level of income to any substantial degree. In spite of this, in most cases, the interviewees claimed that it still had improved their quality of life. Persons who had roughly the same income as before the loan still praised it, since it had given them the chance to start an enterprise instead of looking for short-time jobs. At least three persons used the loan to buy a tool, which allowed them to produce goods at a quicker pace. So far they had not increased their sales greatly, but it has allowed them to work less for the same pay. Of course, this should have been accounted for in the survey. Working hours should have been a variable, especially since several persons referred to the loan as a means to increase the working capital of their business. A large part of the loans went to businesses that

sell goods in the street. These entrepreneurs spend a lot of time on trips to a wholesaler where they buy the goods. The loan allows them to do fewer trips, thus gaining a lot of time. Others invested in a small carriage which allowed them to increase their market space, or variety of products.

Of course, not everyone was positive. Several persons complained about the short loan term, and argued that eight weeks is too little time for an investment to give returns.

Even if it is hard to demonstrate that these findings are representative of wider populations, there is no doubt that the loans, to many, at the very least, have increased hope of a better life.

9 Conclusions

The purpose of this thesis has been to study the micro-credit programme of the organisation *un Techo para Chile*, and see if it has had an impact on monthly income. Based on the analysis above, there seems to be substantial evidence to support the first hypothesis: that the persons who received a loan increased their income more than the persons who did not receive a loan. Excluding outliers, the sample group increased its income twice as much as the control group. Apart from the loan, the results of the econometric model showed that *amount of loans* and *education* were significant explanatory variables. The second hypothesis, that income changes are negatively correlated with income before the loan was also supported by the data presented in this study, although the correlation was only significant for 2nd time debtors.

However, the reliability and the validity of the conclusions of this study are highly dependent on the data collected. Several factors may have affected negatively the quality of this data. Here, only the three most important ones are mentioned.

1. **Recall data was used.** The survey tried to measure the change in income during a year, between 2005 and 2006, and the values collected for 2005 are recall data. This, of course, is not optimal since it increases the risk of selective and/or distorted data. On the other hand, one year is not a long time, and it is probable that people living on the margin have a strong sense of their actual income.
2. **Test.** The interviewees may have perceived the interview as a test that would affect their future possibilities to receive a loan. This risk should have been minimized since all the interviews were performed without interpreter or staff from the lending organisation.

3. **Selection bias.** The selection of individuals for both the sample and the control group was randomised, but some of the chosen individuals in the sample group could not be found and were replaced with other. This obviously affects the reliability of the study. How this missing data would have affected the result is not clear.

Finally, there is also a need to mention the problem of inherent qualities. Did the income of the sample group increase more than that of the control group as a consequence of the loan or because of some inherent quality in these individuals? It could be for instance that they are more entrepreneurial than the individuals in the control group.

All this said, I still feel that this study has shown that the micro credits did have a positive impact.

9.1 Further research

Generally, and even more so in Chile, there seems to be a lack of long term micro-credit studies; studies that follow a sample and control group during several years. Only then would it be possible to measure the long-term impact of a micro credit. Especially surprising is it that very few micro-finance institutions perform these kinds of studies.

Likewise, it appears that not many micro-credit studies use econometric methods to measure the impact of different explanatory variables. The model used in this study has many short-comings and could easily be improved and expanded.

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Appendix A

Table 13: List of settlements visited

Colina
Estación Central
La Florida
La Pintana
Lampa
Lo Barnechea
Lo Espejo
Macul
Maipú
Puente Alto
Renca
Talagante

Table 14: Coefficient correlations

Correlations	Inc before	Children	Age	Sex	Education	Amount of loans
Inc Before	1.000	-.057	.025	-.099	.108	-.408
Children	-.057	1.000	.026	.008	-.100	.067
Age	.025	.026	1.000	-.003	-.097	-.016
Sex	-.099	.008	-.003	1.000	-.005	.063
Education	.108	-.100	-.097	-.005	1.000	-.069
Amount of loans	-.408	.067	-.016	.063	-.069	1.000

Source: own survey.

Appendix B – the original survey

General

Fecha de esta entrevista/encuesta: _____

Campamento: _____

¿Hace cuántos años que usted vive en el campamento? _____

Sexo del encuestado: _____

Edad del encuestado: _____

Años de escolaridad: _____

¿Cuántas personas viven en el hogar? _____

¿Cuántos son menores de edad en el hogar? (Menores de 18): _____

¿Cuándo recibió el préstamo UD? _____

El ingreso

¿Cuál fue el ingreso mensual aproximado que usted tenía en marzo 2005? _____

¿Cuál fue el ingreso mensual aproximado que usted tiene hoy (marzo-abril 2006)? _____

El préstamo

Número de préstamos de UTPC (un Techo para Chile): _____

¿Para qué fue utilizado el último crédito (producción, servicio, comercio)? _____

¿El negocio se realizó dentro del campamento o fuera de este? _____

Appendix C – translated survey

General questions

Date of interview: _____

Settlement: _____

How long have you lived in the settlement? _____

Sex: _____

Age: _____

Years of schooling: _____

People living in the household: _____

Children (<18 years of age): _____

When did you receive the loan? _____

Income

Estimated monthly income in March 2005: _____

Estimated monthly income today (March-April 2006): _____

The loan

Number of loans received from UTPC: _____

Purpose of loan (production, service, trade): _____

Did the enterprise take place within the settlement? _____