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**Analysis of the Incentive Mechanisms of Individual and Group-  
Microlending Contracts**

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## **Abstract**

This dissertation analyzes the incentive mechanisms of the group- and the individual-based micro-lending contracts. The success of group lending has been attributed to the ability of the lender to alleviate asymmetric information problems. The existing theoretical literature offers a number of explanations for this phenomenon including the building of homogeneous groups, strong social ties between group members, internal group pressure to repay loans, and a willingness to help fellow group members. Using data from a questionnaire given to 236 borrowing groups of the microfinance institutions Constanta (Georgia) and FORA (Russia), this study describes to what extent borrowers behave as predicted by theory. According to the empirical results, the assortative matching brings informational advantages to the lenders and helps them mitigate the adverse selection problem. It is, however, not an absolutely necessary condition for the success of the group lending. When the selection period is very short borrowers often group randomly but perceive the group as a kind of an insurance mechanism and subsidize each other in case of delinquency. After the loan disbursement, there exist sufficient individual incentives for each group member to repay his loan as long as the development of his business enables him to do so. When external shocks cause repayment problems, the incentive system induces mutual activities, such as peer support, peer monitoring, and/or peer pressure. The intensity and the efficacy of these activities strongly depend on the self-selection process. Further, the proposed dissertation demonstrates that the incentive mechanisms work better if the loan officers fulfill their complementary duties in the screening and enforcement process. It also makes clear that the dynamic incentives of gradually increasing loan sizes have to be restricted if the two long-term problems, i.e. the mismatching problem and the domino effect (when all group members refuse to repay), are to be tackled successfully.

The analysis of the individual lending mechanism - based on the experience of 130 borrowers of the Microfinance Bank of Georgia – shows that there are three core elements, a) the demand for non-conventional collateral, b) a screening procedure which combines psychological with economic elements, and c) dynamic incentives, which ensure high repayment rates of up to 100% if small amounts of capital are lent on an individual basis.

Finally, the analysis of the key characteristics of the surveyed borrowers reveals that the target group, which can be efficiently served by either one of the two mechanisms, is different. Individual loan contracts better fit to businesses with a dynamic perspective, joint-liability approaches better fit to rather static businesses. Only borrowers with a dynamic perspective but without collateral are forced to make use of the joint-liability approach until they are able to switch to individual loans. The conclusion is that there is no better design than a combination of individual-based and joint-liability loan contracts if a micro-lender aims to reach all types of micro-entrepreneurs in a certain region.

# I Introduction

## 1. Statement of Problem

One of the major obstacles to the development of the small-scale private sector in the transition economies proved to be the lack of financial capital for micro and small business. Until recently, the entrepreneurial initiatives of the low-income persons were hampered since most of them were excluded from the credit market. As a consequence, due to the lack of financial resources, they were either not able to be self-employed, or, if they had started their own business, were not able to expand it to a size sufficient to generate income above the poverty line.

The main reason for the imposed financial restrictions was the fact that most institutional lenders – using conventional credit technologies - considered the disbursement of micro and small credits as highly inefficient. Firstly, they could not ascertain the applicants' risk type since the majority of low-income entrepreneurs were not able to signal their creditworthiness either by pledging collateral or by presenting official financial analysis. Secondly, in the traditional banking system the required loan amounts were deemed as too small to be profitable.

In the last decades, new lending technologies have been developed to tackle the above problems. The new technologies have been implemented by specialized Micro-Finance Institutions (MFIs). They have proved to work successfully in many transition or developing countries in the Eastern Europe, Latin America, Asia, and Africa. Lenders can choose between two different contract designs: the individual and the group micro-lending contract. Under the group contract, loans are given to individuals who are required to form credit groups of three to fifteen persons where the members are held mutually responsible for all credits until everybody has fully repaid his debt. The group is believed to secure the loan just as the “conventional” collateral does, reducing thus the cost of screening, monitoring and enforcing credit contracts. Along the joint liability of the borrowers, the mechanism employs a combined set of incentives including also the so-called credit rationing (repeated access to further credits if previous loans are repaid), the dynamic incentives of increasing loan sizes, and the regular repayment schedules.

A number of theoretical models explain how the combined mechanism drives high repayment rates. Nevertheless, doubts have been expressed that the mechanism per se – without the influence of other factors not considered in the models – is able to induce on-time repayments. The main reason for this skepticism is the fact that along the MFIs, which report repayments of nearly 100 percent (e.g. Fundusz Micro (Poland), Banco Sol (Bolivia), Constanta

(Georgia), FORA (Russia)), there are projects in Albania, Malaysia, India, etc. where the delinquency rate grows to sometimes 70 percent. The experience shows that often the reason for the breakdown is the loan officers' failure to fulfill their duties in the screening and enforcement process. The latter includes first of all: a) to choose the accurate target group (mostly economically active poor people who have no or only very limited access to the regular banking system, otherwise the credit rationing would be undermined); b) to leave the applicants to freely choose their peers without intervening in the process of group formation; c) to ensure the strict enforcement of the group liability mechanism (denying further loans to the complete group if it fails to repay all loans).

The existing literature is abundant of theoretical models on various micro-lending mechanisms but is scarce of empirical studies. Still there is less evidence what factors induce the loan repayment. This dissertation studies the multi-stage process between the borrowers and verifies what components of the joint-liability approach are most important in driving high repayment rates, and what components show to have no impact on the repayment behavior. Furthermore, it analyzes to what extent the institutional and cultural settings affect the group dynamics and what are the factors whose impact stays stable. For this purpose, the same research methodology is used to analyze the credit technology of two different group-lending MFIs, FORA (Russia) and Constanta Foundation (Georgia).

The other type of contract specially designed for crediting micro and small businesses – individual micro-lending contract – requires from the borrowers to back their loans by pledging collateral. To mitigate the problems created by the informational asymmetries between contracting parties, lenders employ a new non-conventional lending procedure that combines elements from the traditional credit technology (the collateral) with methods also used in the group-lending technology, such as regular repayment schedules, credit rationing, and progressive lending. In addition, the MFIs strongly rely on a detailed analysis of borrowers' business and household.

There are many MFIs all over the world which using either contract achieve high repayment rates and secure their operational and financial self-sustainability. Nevertheless, proponents of both methods criticize the work of the other side and suggest that the one method should be substituted by the other. The main argument raised against the MFIs offering only individual contract is that they serve predominantly entrepreneurs whose income lays high above the poverty line since the collateral requirement per se makes it impossible for the poor people to apply for a loan.

The group-lending contract is criticized for transferring the biggest part of the lending risk and costs from the lender to the borrowers (by inducing peer monitoring, peer pressure, mutual auditing, etc.), thus significantly increasing the price of the borrowed capital. Further, it is

assumed that the restrictive increase of loan size decelerates the development of clients' businesses.

Here it is argued that in the practice most of these arguments become irrelevant. The proposed study aims by comparing samples of individual and group micro lending contracts to contribute to the better understanding of the advantages and the limits of both mechanisms.

## **2. Research Objectives**

By studying the borrowers' behavior in three of the leading MFIs in Russia and Georgia the dissertation aims to reveal the factors that determine the success of the group and individual micro-lending mechanisms in inducing on-time repayments from micro-entrepreneurs who are believed to bear high investment risk. The analysis is divided into four parts. First, it separately analyzes the group dynamics in each of the studied group-lending MFIs. Starting with the screening process, it investigates whether the clients always group homogeneously with respect to the investment risk and if not what are the consequences of a random grouping. Subsequently, it tests the validity of the theoretical proposition that only low-risk groups self-select into micro lending programs.

The analysis proceeds with studying the borrowers' behavior after the conclusion of the lending contract. The central question is whether the set of incentives is sufficient to make the loan repayment an individually rational choice where no peer components are activated, or whether it is the group mechanism, which induces peer monitoring, peer pressure and peer support, thus indirectly ensuring high repayment rates. Further, I investigate under what conditions the borrowers intensify the intra-group activities and I verify the role of the lending components beyond the joint liability – dynamic incentives and loan officers' work – for the improvement of the clients' repayment performance.

Second, the dissertation illustrates to what extent the institutional and cultural settings determine the efficiency of the lending mechanism. A direct comparison between the two group-lending MFIs allows both to study the impact of the initial intra-group information on the process of assortative matching and to show how this information affects the peer measures taken by the group members after the disbursement of the loans. Next, the data gathered in Constanta and FORA are pooled to examine whether borrower-specific and group-specific characteristics, which do not result from the risky project (e.g. gender, group size, alternative sources of income in the household, borrower's credit history, wealth, etc.), influence the likelihood of individual borrowers' default, on the one hand, and the group' ability to independently solve the internal repayment problems, on the other hand.

Third, the dissertation studies the components of the individual micro-lending technology. Going through the screening, monitoring and enforcement process of a typical individual loan contract at the Microfinance Bank of Georgia (MBG) it aims to find out (1) to what extent each part of the incentive mechanism, including the loan officers' screening activities, contributes to the high repayment rates and (2) to what extent potential competitors may reduce the provided incentives to the borrowers to return the received capital.

Fourth, the incentive mechanisms of the individual schema are compared with those of the group schema and several tests are developed in order to detect the factors that determine the choice of a lending contract. The last issue to be analyzed is how the coexistence of group and individual micro lending programs influences the distribution of potential borrowers.

### **3. Theoretical Foundations of the Micro-Lending Technologies**

#### **3.1 Group Lending**

The main problems in crediting low-income entrepreneurs come from the fact that the latter cannot signal their creditworthiness. As a result, the banks - being not able to accurately ascertain the applicant's risk type - would offer to all clients the same nominal interest rate, which has to be high enough to cover the per-loan capital costs. As in the lemon model of Akerlof (1970), the presence of considerable amount of high-risk borrowers will push the equilibrium interest rate high enough to drive the safe borrowers out of the market (the problem of adverse selection).

Moral hazard and enforcing repayments are the other two main problems created by the asymmetric distribution of information between lender and borrower. Project's payoff, and thus bank's profitability, depends in part on borrower's activities, including levels of non-tradable inputs. In the absence of collateral, the borrower does not fully internalize the cost of project failure and therefore is more likely to divert means and efforts away from the business. Moreover, the costly information acquisition does not allow the bank to efficiently control the poor borrowers and, respectively, to prevent them from undertaking risky activities. The lender's inability to costlessly observe the outcome of the business projects and enforce repayments encourages some borrowers to default strategically.

Theoretical literature on micro-finance suggests numerous modes that explain how the joint-liability approach tackles these problems. The models examine the behavior of the borrowers either before or after the conclusion of the contract. Before the loan disbursement, any group-lending organization is confronted with the problem of adverse selection, which according to the theory could be avoided by inducing the applicants to self and co-select in credit groups

(see e.g. Varian [1990], Ghatak [1999], Kritikos [1999], Morduch [1999], Van Tassel [1999], Armendariz de Aghion and Gollier [2000], Laffont and N'Guessan [2000]). It is expected that borrowers from the same locality have sufficient information about each others' assets, capabilities, and character traits and will use it to form homogeneous groups with respect to the investment risk. The reason: any risk type of borrower who aims to maximize his utility will try to keep the probability of default within the group as low as his own default probability. As a first result of the matching, safe types are teamed with safe types and risky types might be teamed with risky types.

Moreover, risky types will face higher expected borrowing cost than safe types. Since their partners are more likely to fail, the expected return is negative for risky borrowers if the joint-liability component is sufficiently high. It is then a second result of the mechanism that it pays only for low-risk types to apply for a peer group loan. The problem of adverse selection will thus be reduced by a self-selection process of lower-risk borrowers.

Recently a new adverse selection model has been developed stating that assortative matching is not necessary in order to tackle the problem of credit rationing (cf. Armendariz de Aghion and Collier [2000], Sadoulet [1999]). Success in this case is due to a "collateral effect": Cross subsidization amongst borrowers acts as collateral behind a loan. Borrowers groups are perceived as an effective risk pooling mechanism, which ensures efficiency even when potential partners barely know each other. This finding is of a great importance for the urban micro-lending programs where borrowers are imperfectly informed about each others' types and ex post auditing by banks is costly.

When the contract is concluded, the borrowers may confront the MFI with moral hazard and repayment problems. The theoretical analysis of the group lending mechanism shows that the access to further loans as well as the access to higher loans (called 'dynamic incentives'), which is made conditional on the repayment of all borrowers in the group, creates an incentive for peer monitoring, peer support and peer pressure among the borrowers (cf. Stiglitz [1990], Varian [1990], Banerjee et al. [1994], Besley and Coate [1995], Hulme and Mosley [1996], Ghosh and Ray [1997] Armendariz de Aghion [1999], Kritikos [1999], Morduch [1999]). Being threatened with exclusion from the access to further loans if one (or more than one) member does not repay, each person will monitor the peers so that investments are undertaken in the most profitable way. Further, each person will support the other group members if they face repayment problems they are not responsible for, and each borrower will be put under pressure if the loan is misused. As a result, the probability of moral hazard behavior is sufficiently reduced because a considerable part of the risk is transferred from the lender to the borrowing group.

Similar reasoning holds for the problem of strategic default – when borrowers are able but unwilling to meet their debt obligations. The lender’s enforcement capacity is created through the termination threat. (cf. Besley and Coate [1995], Armendariz de Aghion [1999], Kritikos [1999])) With joint liability, if any borrower fails to repay his share of the loan, the whole credit group is considered as being in default and all peers lose access to subsequent loans. Therefore, the group is motivated either to repay for the delinquent partner, or by exerting social pressure to make him reconsider his repayment decision. As a consequence of this set of incentives, lenders are able to achieve with high probability the repayment of the loans.

The main problem of the joint-liability mechanism arises from the fact that a complete group is excluded from the access to further loans if the previous loans of all members have not been fully repaid. At the worst, one defaulting member may cause a domino effect when the fellow group members are not able (or willing) to cover his/her installments. In this case, the group members’ best strategy is not to repay their loans because the complete group will be excluded from access to further loans irrespective of their individual ability to repay their own loan (cf. Besley and Coate [1995], Paxton [1996], Kritikos [1999]). This outcome is disadvantageous for the MFI (in particular in comparison to an individual lending scheme) because all other group members - except the defaulting borrower - could have repaid their loans.

From the theoretical point of view, the probability of defection of the complete group can be reduced if the set of mechanisms is designed in a way that it only pays for safe (or low risk) borrowers to apply for a joint-liability loan. In a group of safe borrowers the probability will be low that more than one borrower is unable to repay if the business correlation of the borrowers is not too high (cf. Kritikos [1999]). For one defaulting borrower, however, the MFI can be almost sure that the rest of the group will be able to temporarily cover his installments.<sup>1</sup>

### **3.2 Individual Lending**

Most individual MFIs (and in particular the one studied here) provide financial services only to entrepreneurs who are able to pledge collateral. Collateral - covering as a general both the loan amount and the interest payment - signals the borrower’s willingness to fully repay the loan. Therefore, it is seen as the main mechanism tackling all typical problems of a loan contract: adverse selection, moral hazard, and repayment enforcement.

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<sup>1</sup> From field experience, one may add that the analysis of a typical MFI loan officer focuses exactly on this problem. When a group is freshly formed but before loans are disbursed, the loan officer has to evaluate to what extent a group is able to cover the installment of a defecting member. This is addressed by making an analysis of the expected future cash flows of all borrowers. Loans and repayment schedules are then designed in such a way that each borrower, assuming his business develops as planned, is able to cover his own rates but also (at least partly) those of his fellow borrowers.

To further mitigate the adverse selection process the individual micro-lending institutions introduce a complementary screening process (cf. Gonzales Vega et al. [1997] or Churchill [1999]). The main role is given to the loan officers who try to generate as much information about the borrower's capacity and willingness to repay as possible (for a detail description of the procedure see Chapter 2). The expected results of the combined measures of signaling and screening are: First, only borrowers whose investment project promises a high probability of success are selected. Second, borrowers may have access to higher loan volumes without further screening efforts of the loan officer (Madajewicz [1999]).

The main tool used by the individual lenders to prevent the clients from moral hazard behavior is the regular repayment schedule. Armendariz and Morduch (1999) argue that regular repayment schedules (1) screen out undisciplined borrowers; (2) give loan officers early warning about emerging problems; and (3) provide bank staff with valuable information about clients' behaviour over time. For example, if the loan contract foresees weekly or monthly installments, the loan officer receives early information if the borrower is undisciplined or faces a problem in his business. Furthermore, regular repayments, in particular if the repayment schedule has started before the investment has created income to the borrower, enables the MFI to lend against further income streams of the borrower's household. Hence, with introducing this program feature the MFIs expect to both sufficiently reduce the possibility of moral hazard behavior and diversify the business risk in the credit groups.

When it comes to the enforcement of loan contracts (if a borrower rejects loan repayment), the loan officers again plays the main role by warning and if necessary sanctioning defaulting clients. Except the threat of selling the collateral within few days, they can cut off borrowers from further access to loans. The effects of non-refinancing threats were first formalized in Bolton and Scharfstein [1990]. Borrowers with satisfactory repayment records may receive access to further loans of increasing volume. This gives sufficient incentives to all entrepreneurs who expect positive utility out of future investments (financed by future loans) to repay their current loan as scheduled.

One of the most serious weaknesses of the individual micro-lending contract is that in a high competitive environment the incentives created by progressive lending perspectives receive a severe limitation (at least as long as there is no credit-rating agency). As shown in Armendariz and Morduch [2000], "the greater the likelihood of refinancing by a second lender, the weaker will be the incentive to repay the first lender".



#### **4. Earlier Empirical Research**

Most of the above theoretical propositions are supported only by various anecdotes from particular micro-lending programs. There is still not enough empirical evidence that unambiguously confirms the efficiency of the applied incentive mechanisms. This section presents the results of the most rigorous empirical studies that have been conducted so far. Their main shortcoming is that only particular aspects of the joint liability approach have been investigated without providing a thorough analysis of the complete dynamics of the mechanism.

Table I.1 (App.A) presents a short summary of the most interesting empirical findings. It illustrates the fact that the key components of the group-lending mechanism do not have an unambiguous impact on the borrowers' repayment performance. Their influence varies from country to country depending on the local conditions and cultural peculiarities.

A series of papers focuses on selection issues and in particular on the process of group building. Somewhat confusing is the fact that most empirical analyses do not confirm the commonly held assumption of homogeneous matching. Using survey data from Guatemala, Sadoulet and Carpenter found that some borrowers choose to form heterogeneous groups, using thus the group lending as a form of insurance. Applying the same methodology to data gathered in two microcredit programs in Eritrea, Lensink and Mehrteab report that their results unambiguously indicate random self-selection in groups.

However, it seems that there is no contradiction between theory and praxis when testing the assumption that self-selection brings informational advantages to the lenders. Wenner [1995] used the data from 25 Costa Rican FINCA credit groups to study the validity and cost-effectiveness of group lending as a means to transmit information about borrower creditworthiness. He found that members of groups engaged in formal screening (with an internal code of regulations) had a low probability for delinquency, indicating that screening indeed resulted in an informational efficiency gain.

After the loan disbursement, the intensity with which the borrowers employ the incentive mechanisms strongly depends on the environment. In one of the most well-known empirical investigations, Wydick [1999] studies the impact of different kinds of social cohesion on borrowing group performance: social ties, peer monitoring, and peer pressure. Using data from a survey of an ACCION International affiliate in western Guatemala, he found that strong social ties have no or, rather, a negative effect on group behavior. Improvement of the repayment performance was associated mostly with variables used as proxies for peer monitoring and peer pressure. Not necessarily in contradiction to this, Mondal and Tune [1993] emphasize that too weak social ties may also lead to negative outcomes, in the sense

that there is no willingness to support the fellow group members. Different are the findings of Zeller [1998], who showed that in rural Madagascar, groups with a higher level of social cohesion had a significantly higher repayment rate.<sup>2</sup> His analysis is based on a random sample of 146 groups from six different lending programs in the country. Paxton [1996] investigated the group dynamics of the MFI PPPCR<sup>3</sup> based on the game-theoretical model of Besley and Coate and reached a similar conclusion. The empirical results indicated that urban, homogeneous groups with sufficient training and reliable leaders had the highest probability of repaying their loans.

In her further investigations, Paxton [1996] studies along the group integrity a number of other factors that have been postulated in the literature as major determinants of the group repayment. Studying the domino effect, she found that it significantly influences the loan default rate. Paxton also detected another obstacle, the mismatching problem that is rarely discussed in theory. She found that groups tend to experience repayment difficulties after several loan cycles, which they could not foresee during the process of building the group. As loan sizes increase due to the dynamic incentives preferred loan terms and volumes will differ with the consequence that borrowers with smaller loan volumes will reject joint-liability for borrowers with higher loan volumes in the same group if the latter run into repayment difficulties. The author showed that the probability of loan repayment might decrease if a group runs into the mismatching problem.

None of the empirical investigations explicitly studies the role of the factors peer support and dynamic incentives. Worth noting is also the fact that researchers either investigate the clients of a single lender only or if combining data from different sources design the analysis in a way that does not enable them to test for existing differences in the group dynamics in each of the surveyed MFIs. The main contribution of the proposed dissertation is that it studies the main components of the joint-liability lending contract by separately analyzing and then comparing the borrowers' behavior in two different MFIs. This approach allows identifying the factors that always work in the same way and differentiate them from the factors which significance strongly depends on the cultural peculiarities and/or the design of the lending program.

## **5. Structure**

The rest of the dissertation is organized as follows. After describing the economic and institutional environment for microfinance in Georgia and Russia, Chapter II presents the key features of the three surveyed MFIs. Based on the main assumptions postulated in the

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<sup>2</sup> Also worth mentioning is the discussion that shows that using social ties for the enforcement of loan repayment may have a negative impact on the village structure (see Ghatak and Guinnane [1999]).

<sup>3</sup> Le Project de Promotion du Petit Credit Rural (PPPCR), a group-lending organization in Burkina Faso.

theoretical literature I build in Chapter III a system of hypotheses that enable me to reveal the complete dynamics of the group and the individual micro-lending technologies. For testing the hypotheses, a multi-stage econometric model is designed in the way that it replicates the two-stage nature of the principal-agent game: the stage where the borrowers are screened, i.e. before the contract is signed, and the stage where the repayments are enforced, i.e. after the loan disbursement.

Chapter IV presents the empirical results. It illustrates how the entire system of incentive mechanisms works and highlights the factors that mostly help the group and the individual MFIs solve the adverse selection, moral hazard, and enforcement problems. Subsequently the group versus individual lending debate is addressed. Finally, in Chapter V I draw some conclusions with respect to the validity of both methods.

## **II Micro-Lending in Georgia and Russia**

The analysis presented here is based on the experience of the biggest MFIs in Georgia and Russia: Constanta Foundation, Microfinance Bank of Georgia (MBG), and FORA. This chapter describes the characteristics of the lending programs and the environment in which they operate. In addition to the secondary literature that were used to collect information about the institutions extensive interviews with the branch managers and the loan officers were performed in order to study in details the lending procedure, to get better overview of the clientele, to learn about the macroeconomic situation, the local market structure, and the ethnical and cultural peculiarities.

### **1. Microfinance in Georgia**

#### **1.1 Microfinance Demand**

In the years after the breakup of the Soviet Union Georgia underwent difficult political and economic transition. The ethnical and religious heterogeneity of the population caused enormous tension by the time the country won independence in 1991. As a result of the civil war (1992 – 1995) and the acute armed conflicts in two of the autonomous republics, South Ossetia (1991) and Abkhazia (1992 – 1993), the country's gross national product contracted by around 80 percent. Gross economic activities declined by two thirds from their pre-independence level. The annual GDP per capita fell to US\$ 410. Corruption has become a wide spread phenomenon in the society, substantially contributing to the abrupt rise of the income inequality.

The overall economic decline caused a rapid increase in the unemployment rate. Because of the authorities failed to adapt the social security system to the changes in the economy, the benefits fell below the subsistence level. The number of newly impoverished households sharply rose, making the poverty one of the country's most acute problems. According to the Georgian Strategic Research and Development Center, in 2001 the current income of 49.6 percent of the population was lying below the subsistence level of 102 Georgian Lari (GEL) or USD 51. Very critical was the situation in Tbilisi, where more than 57% of the population lived in poverty. Relatively better was the situation in Adjara, an autonomous republic and politically the most stable region of Georgia, where the income of only around 40% of the population was below the poverty line.

Notwithstanding the slow improvement in the economic conditions in the last few years, there is still a clear tendency of continuous unemployment growth. Compared to 1999 and 2000, in 2001 unemployment grew in nearly all regions of Georgia. The majority of employed people are not financially better off since the average monthly reward makes GEL 20 (USD 10). In the public sector, the salaries are inadequate and are rarely paid on a regular basis. The remuneration in the informal sector of the economy is not much higher and usually it does not include social benefits or guaranties. Consequently, approximately three fourth of the population needs to think about alternative means of income generation.

In order to survive many people engage in self-employment micro-entrepreneurial activities. They constitute the main part of the micro-credit clientele in the country. Micro-entrepreneurs can be found in the huge colorful and overcrowded open markets called *bazaars* or in a large number of kiosks and small shops, bakeries, barber shops, tiny dental offices, private taxis and minibuses, etc. Those without permanent stalls display their inventory on the top of cardboard boxes or sometimes even hold them in their hands. Artisans sit in the streets in well-known and crowded places selling their handicrafts. Popular trading items are flowers, bananas, newspapers, cigarettes, soft drinks, and alcohol. Many street vendors start with the minimum amount of products – just a couple loaves of bread, or some sunflower seeds, home-made dried tobacco, couple of second-hand cloths, etc.

Other micro-entrepreneurs operate at home, doing sewing, baking small cakes or khatchapuri (a kind of Georgian cheesecake), cooking ordered dinners, giving lessons, etc.

The main limitation for the development of these businesses is the lack of working capital. Usually a small amount of additional financial means is needed in order to diversify the products, to extend the stalls, to repair the production tools (e.g. stove, microbus, piano, etc.). There is a huge need of specialized micro-lending organizations since the formal banks do not have the practice of granting small size (GEL 100 – GEL 2000) credits, and in addition

impose stringent collateral requirements that cannot be fulfilled by the majority of the Georgian micro-entrepreneurs.

## **1.2 Development of the Microfinance Sector**

The civil war and the armed conflicts in South Ossetia and Abkhazia led to an internal and external mass displacement of people of different minorities as well as ethnic Georgians. Hundreds of thousands refugees in and around Tbilisi attracted the attention of numerous international humanitarian organizations. A series of granting programs, microfinance among them, were initiated. In 1999, the activities of around 50 NGOs were strictly oriented toward internally displaced persons (IDPs). Most of them dealt initially with direct input distribution or grants. The so-called “food for work” programs offered food to the most vulnerable unemployed individuals and in return required from them to actively participate in different rehabilitation activities (e.g. the rehabilitation of tea plantations in 1998). Other organizations implemented a number of small-scale projects by providing beneficiaries with in-kind assistance or by supporting specific businesses with small grants. For example, the Norwegian Refugee Council helped to establish a pig-breeding farm in Abkhazia; subsidized a program that enabled IDPs to buy one cow each; started in Sukhumi a program for making small grants to micro-entrepreneurs in the range of US\$ 100 to US\$ 5 000.

None of these programs was focused on sustainability. As they considered themselves humanitarian, they did not enforce any repayments. The managers of the local MFIs complain that these practices spoil the environment for the pure loan-oriented programs and thus hindered their early development. Because considerable part of the micro-entrepreneurs got used to the non-repayment practices, some micro-lenders, such as Constanta and Finca, spent initially a lot of time and efforts in disciplining their borrowers.

The first MFIs in Georgia started as relief organizations, assisting predominantly women and/or conflict-affected people. World Vision International (WVI) was among the pioneers. It began its operations in 1996 with providing small grants for micro businesses, but soon transformed into a pure lending organization. WVI operates exclusively in Tbilisi, targeting entrepreneurs whose income lies above the poverty line. In October 1997, another NGO, Constanta, started providing micro loans. Its target group consisted exclusively of internally displaced women, mainly refugees from Abkhazia and South Ossetia. While World Vision International offered exclusively individual lending contracts with collaterals exceeding 100% of the loan amount, Constanta granted loans to solidarity groups with no collateral requirements, serving thus considerably lower-income micro-entrepreneurs. Ten months later, FINCA Georgia started its activities, using a lending technology that was very similar to that

of Constanta. Being strongly socially oriented, it also targets mostly refugees and internally displaced people.

The Microfinance Bank of Georgia is one of the youngest MFIs. It was founded in May 1998 and in contrast to the other micro-lenders, is an officially licensed banking institution. MBG provides micro and small loans to individuals who are able to pledge collateral. The loan amount varies from US\$ 50 to US\$ 50 000, showing the larger range of clientele served by the bank.

A common feature of Georgian MFIs is the lack of any saving components in their programs. In the first years of the transition period, the majority of depositors lost nearly all their savings in widespread pyramidal financial institutions or bankrupted banks. Several years ago, Georgian financial sector collapsed. As a result the number of the banks shrunk from 232 in 1995 to 28 in 2001. Nowadays, Georgians widely distrust the formal financial institutions. They usually keep their money at home in US dollars or in gold.

Another obstacle the new micro-lenders need to overcome is the domestic perception that the entire financial system is corrupt. Corruption has become extremely widespread phenomenon in the society. Most Georgians believe that the real goal of all organizations, regardless their activities, is to merely ensure the prosperity of their management. A number of impact surveys conducted by the Constanta Foundation<sup>4</sup> show that the local MFIs are also viewed with doubts: “We thought they are corrupt”, “I was often asked, how much was their share?”. The mistrust, however, vanishes soon after borrowers’ first contacts with the loan officers.

The next specific feature of the micro-lending borrowers in Georgia (and in the whole post-soviet area, incl. Russia) that differentiates them from the microfinance clientele in the rest of the world is their educational level and the previous social status. According to data provided by the State Department of Statistics, the level of education in Georgia is quite high. The number of illiterate population is less than 1 percent because until recently, the secondary education was compulsory. Moreover, approximately 80% of micro-entrepreneurs have some higher education. A survey carried out in 1999 shows that among them 40% are teachers, 30% engineers, 10% economists or accountants, 6% medical doctors, 6% painters, and 8% are representatives of other professions. During the Soviet era most of these people lived comfortably, owned good apartments, even houses. They were used to well-paid government jobs and respectful treatment from the community. Part of them stood high in the social hierarchy and even belonged to the local elite. Therefore they find the work outdoors humiliating. Such feelings often restrict them in their business activities and significantly reduce their productivity. Microfinance managers share the opinion that clients who lack

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<sup>4</sup> “Effect of micro-financing service on poor entrepreneurs of Georgia”, an impact survey conducted during the period of April – June 2001 by the association “Women for Urban Development” on the bases of contract with Constanta Foundation.

higher education are more aggressive and thus successful in the market. They do not mind being in the street and put in their work much more enthusiasm, thus completely compensating the lack of education.

### **1.3 Constanta Foundation**

#### **1.3.1 Foundation and Organizational Structure**

Constanta was founded by the Save the Children's Georgian field office staff in January 1997. Originally, it was registered as an association but in December 1998 was transformed to a foundation. Constanta received its first grant from Save the Children/UNHCR (United Nation High Committee for Refugees) in August 1997 and immediately started its operations.

The initial mission of the Foundation was to provide stable financial services to economically active women, the majority of whom were part of the conflict-affected population: IDPs, refugees and widows (65%). Gradually, Constanta enlarged the target group by expanding its activities to male micro-entrepreneurs.

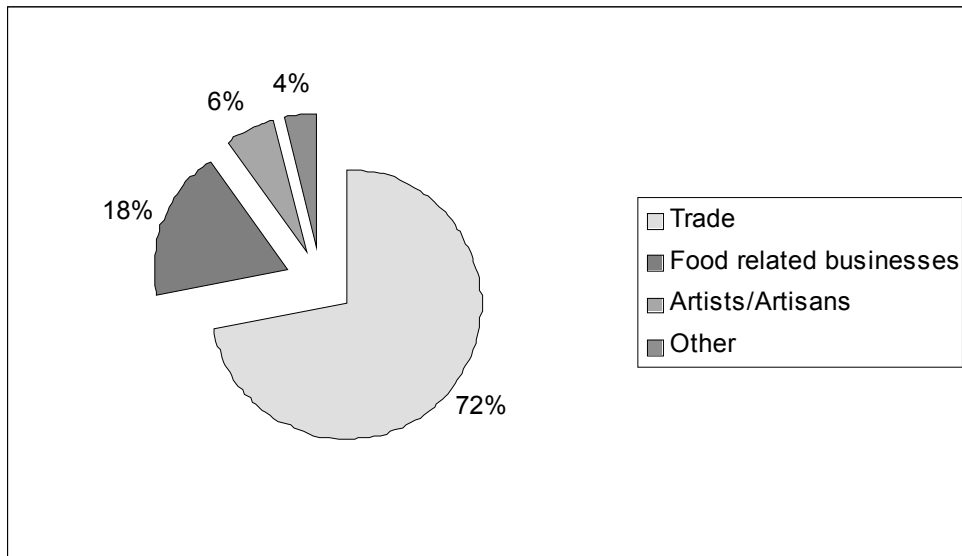
Constanta's managers point out three main reasons for having targeted predominantly women. Firstly, it was believed that, in comparison to men, women had much more limited access to other sources of credits. Secondly, in the course of 90s the social and economic role of women in Georgian society significantly changed. The new reality caused some changes in the distribution of functions within low-income Georgian families. Men, former family supporters and decision-makers became unemployed and very soon lost their confidence. They appeared to be less adaptive to the new reality, resulting in their failure to secure the necessary financial means. In order to support the household, women had to take over micro-entrepreneurial and self-employment activities. Finally, women showed higher responsibility towards the family, spending most of their income for improvement of children's health and education.

Refugees constitute the second biggest target group of Constanta. Only Tbilisi hosts around 30 000 refugees, coming mainly from the conflict-affected autonomous republics, Abkhazia and South Ossetia. Since these people do not have permanent residence, initially they were considered as highly risk borrowers. So far, however, no evidences of worse repayment performance in the branches with higher concentration of migrants have been found. According to Constanta's chief executive, Mrs. Tamar Lebanidze, refugees have proved to be extremely prompt in meeting their repayment obligations. Their only chance to survive is to keep working very hard and continuously extend their tinny businesses, so that the lost property could be at least partly restored. The refugees appreciate higher the opportunity to

receive subsequent loans. Usually, they view the microfinance organization as the only source of financing.

According to a survey, the major sphere of activity for most Constanta's clients (72 %) was trading. Another 18% were enrolled in food related businesses, and 6 % were artists and artisans:

**Figure II.1.** Constanta: Clients' major activities



Since 1997 Constanta's clients' portfolio has been significantly enlarged mostly due to a rush geographic expansion. At the end of 2001, the Foundation had 5 working offices around Georgia – two in Tbilisi, one in Gori, Batumi, and Marneuli (a boarder area with Azerbaijan). The biggest branch outside Tbilisi is the one in Batumi. It is also the place of my empirical investigations and therefore further I am going to concentrate mainly on it.

### **1.3.2 The Batumi Branch of Constanta**

#### **1.3.2.1 Branch history**

The Batumi branch of Constanta (called Constanta 2) started its operations in August 2000. 99 percent of its clients' portfolio consists of petty traders, who have their stalls or kiosk in one of the biggest local open markets – *bazaar* for food, and *hopa* for clothes. Most credit groups are formed by entrepreneurs who work in direct neighborhood and are thus quite homogeneous. As the majority of the group members have been trading together for years, they know each other very well. Usually, Constanta's clients stay on the market from 9.00 a.m. until 9.00 p.m., including weekends. This facilitates the communication between the



peers. The latter often share their family problems, celebrate together various religious and public holidays, etc.

The start-up process for Constanta 2 was quite difficult as most of the entrepreneurs were unwilling to collaborate with any kind of financial institutions. People could not believe that somebody would give out loans without any form of collateral. They were extremely suspicious and often asked absurd questions, such as: “How could I know that you would not run away after giving me a loan?” Constanta’s first task was to gain the confidence fo the locals, which it eventually achieved.

The first groups showed up after 3 - 4 weeks of intensive fieldwork. In the first two months the loan officers spent over 10 hours a day at the local markets advertising the program and establishing personal contacts with traders. Soon after the disbursement of the first loans Constanta experienced a real boom in gaining new clients. The first groups were formed by traders, who not only knew each other very well but also had highly reliable and fast expending businesses. Since the size of the first loans was quite small (USD 50 – 75) the borrowers did not experience any problems with paying the weekly installments. They were quite satisfied with the program and readily forwarded the information about it to their friends, colleagues, and neighbours. The demand for loans grew so rapidly, that the loan officers hardly managed to meet all applicants. In the course of time, however, the first problems with delinquent borrowers appeared, making the rest of the local micro-entrepreneurs cautious and reluctant to join the program. Moreover, for one and a half years since its foundation Constanta 2 has already managed to attract nearly all petty traders from the region who need additional working capital. As a result, the monthly average number of newly formed groups per loan officer reduced from 15-20 at the end of 2000 to 5-6 at the end of 2001.

Constanta 2 should start looking for new target groups. These could be artisans and owners of small kiosks, cafes and bakeries. The biggest disadvantage in working with them is the fact that their groups will not be as homogeneous as the ones formed by traders. The new clients, having their working places far away from each other, will exchange much less information, jeopardizing thus the success of the group lending.

### **1.3.2.2 Lending Technology**

#### *Loan Terms and Conditions*

The branch implements a standard for the whole Foundation group-lending technology, which is based on microfinance best practices and is tailored to fit the specific needs of the country (Table II.1).

The lending technology consists of repeated loans which have a maximum term of four months and which have to be paid back in weekly installments. Loans are granted to groups of 7 to 15 clients each. Group members guarantee each others' loans, and all loans of the group must be repaid in order to have access to subsequent loans. The initial loan size is GEL 100 to 200 (i.e. USD 50 - 100). Loans increase in each cycle by not more than 50% of the previous loan amount. The observed average increase, however, is only 15 to 30%. The MFI charges an interest rate of 4% (flat) per *month* and, in addition, an administration fee of 1% of the disbursed amount<sup>5</sup>. No business plans are required. Borrowers should be over 18 years old, should have started their business and possess at least six months of working experience.

### *Screening*

Clients form their groups deliberately. No family members are allowed since earlier experience showed that close relatives were not willing to impose social sanctions on each other. The prospective group members are expected to know each other very well. Loan officers never intervene in the process of groups building and therefore do not bear any responsibility for problems occurring within the groups. When the group has been formed, members meet with one of the loan officers and attend five promotional-training meetings: first, to learn about the program, to understand group guarantees and responsibilities, to introduce themselves; second, to elect a group coordinator, to discuss the loan application form, to provide detailed information about their businesses (weekly or monthly turnovers, income, expenses, etc.); third, to explain how they understand their obligations towards the MFI, to learn about accounting systems, to fill in the loan applications; forth, to discuss the contract, to hear about the standard procedure of loan disbursement, to meet the supervisor; fifth, to sign the joint-liability contract and to receive the money. There is a 3 – 4 days' interval between the meetings. Meanwhile, the loan officers visit the applicants' working and living places, try to learn more about the members of the prospective groups and the relationships between them. They evaluate the borrowers' financial situation and as a rule refuse to grant loans to groups consisting entirely of very low-income entrepreneurs who do not possess any assets that could be pledged or sold in case of business failure. Loan officers are reluctant to work also with clients who do not have permanent residence in or around Batumi. Such people often apply for a loan and disappear immediately after the disbursement.

Important part of the screening process is the collection of additional, nonofficial information about the applicants. The latter usually comes from established borrowers in the region and

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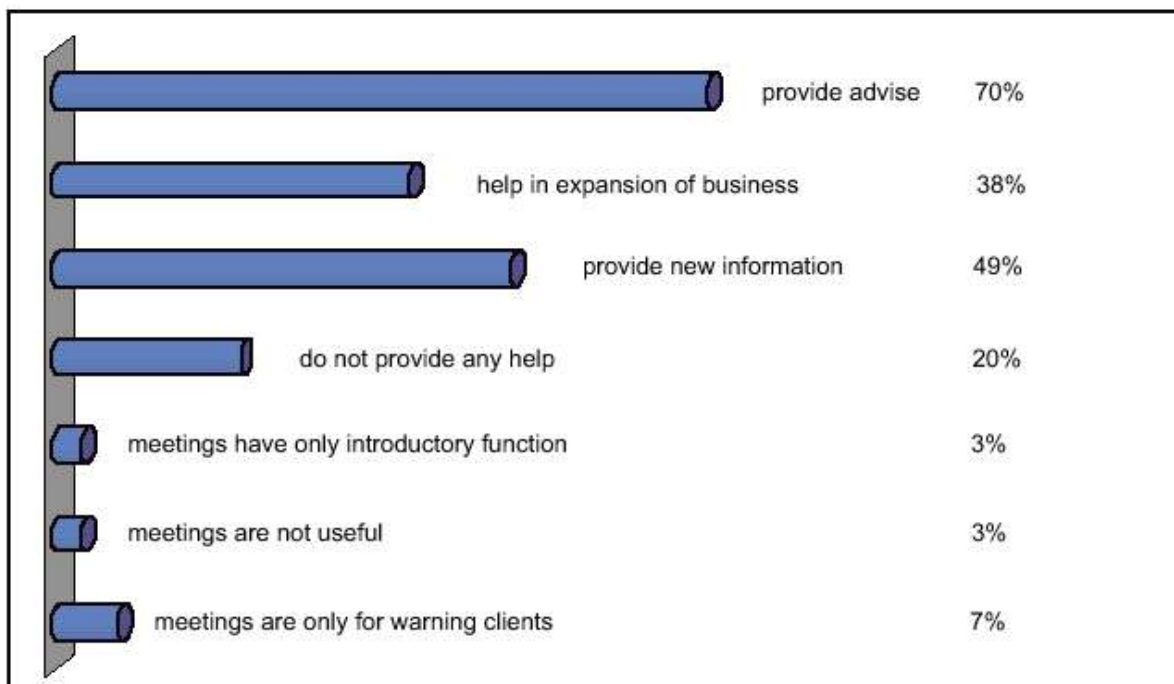
<sup>5</sup> For a loan of 100 GEL, with a loan term of 4 months, and an interest rate of 4 percent per month the total interest payment would be 16 GEL (4% x 100 x 4). The total amount due is thus 116 GEL. It should be repaid in weekly installments of approximately 7.25 GEL each (116/16 weeks). In addition, the borrower has to pay 1 Euro as an administration fee. Thus, a 100 GEL loan costs the borrower a total of 17 GEL for four months.

applicant's colleagues or neighbors. The questioning should be done very carefully, in a manner that is not deemed as insulting for the clients.

The process between first meeting and loan disbursement takes about 2 weeks. Constanta gives one loan per group and each member takes a portion of it. The group coordinator signs for the whole amount.

In June 2001 Constanta, in cooperation with FINCA and some other Georgian MFIs conducted a survey over the effect of micro-financing service on poor entrepreneurs in Georgia. The investigation shows that 38% of clients consider that the training meetings scheduled by the MFIs help them to develop their businesses, 49% think that they provide new information, 23% find them completely useless, 3% say that the only function of the meetings is to get acquainted, and 7% believe that they are called merely to be reminded on repayments.

**Figure II.2.** Constanta: Clients' attitudes on the usefulness of the group meetings scheduled by the microfinance organizations



The respondents used to give more than one answer to the same question.

### *Monitoring*

Between loan disbursement and loan repayment, no official meetings take place. Nevertheless, the loan officers try to permanently stay in contact with the clients. They have found that casual, non-programmed visits work well. Such a visit does not involve detailed analyses of

the use of the borrowed funds. It resembles a brief casual encounter or a quick exchange of greetings when passing by. Important is to give the clients the feeling of being monitored.

This random monitoring does not burden Constanta 2 with additional administrative costs. Over 90 percent of the clients trade on the both biggest open markets in Batumi, *bazaar* and *hopa*. Therefore, when the loan officers go to visit the working places of the new applicants, they automatically pass by the stalls of the most of their clients.

### *Repeated loans*

Constanta uses a highly standardized procedure for approval and disbursement of repeated loans. Borrowers do not submit new loan applications. Three days before the end of the current loan cycle, loan officers accompanied by a supervisor visit the working place of the clients. The aim is 1) to verify that all group members still work and 2) to gather information about the overall situation within the group. During these visits, borrowers may inform Constanta's staff about existing discrepancies between the peers and arrange a group restructuring. An official meeting in the offices of the MFI is scheduled for the day after the visit. All group members who want to receive further loans should come and present their financial results (turnover, income, expenses, profits, etc.). The loan officer updates the financial analyses and, in case of loan approval, sets up the disbursement day.

### *Enforcement*

The next essential aspect of Constanta's lending procedure is the delinquent management. As already mentioned, the main monitoring tool directly applied by the lender is the weekly repayment schedule. On a particular day of the week, a member of each credit group comes to the cashier desk and repays the installments for the entire group. Payments are considered delinquent if the smallest possible amount is missing. In case of delinquency 1% of the late payment (installment) is required as a fine for delay. In addition, after the first late payment, group members are allowed to increase their maximum loan size only by USD 12,5 (instead of 50% of the previous loan or min USD 25) in the next loan cycle. Two late payments reduce the amount to be increased to USD 7,5. The loan size will not increase if there are three or more late payments.

If arrears occur, the first action taken by the loan officer is a visit. The pressure exerted on all members of a delinquent group is enormous. If necessary, the loan officers stay with the clients several days (and nights) in a roll until the complete installment is collected. As a result, at the branch of Batumi only two credit groups refused to pay for a delinquent peer. These were excluded from the program and put into the "black file". In 2002, Constanta sued

one of the groups. After the exclusion of the sentence the members of the second group immediately repaid the debts.

### **1.3.2.3 Performance**

#### *Loan officers' performance*

Initially Constanta was considered to be a pure women organization. Its mission included both to serve and to hire exclusively women. Even though the lending policy changed, the most important eligibility criterion for the loan officers is still to be a woman at the age of 25 to 35 years.

The loan officers' productivity is illustrated by the indicators presented in Table II.2. Each loan officer works with almost 400 people (40 to 50 groups) and attracts on average 33 new borrowers per month. The table shows once again the sharp decline in the amount of clients joining the lending program. It can be seen, however, that this negative tendency does not affect the average portfolio per loan officer since in the course of time the loan size for repeated borrowers automatically increases and thus raises the average portfolio amount.

Loan officers' efficiency and personal skills significantly influence the overall performance of the MFI. Before joining Constanta each loan officer goes through a special selection process, which includes a 10 days' standard training course, two-month field work under a supervision, and a final test. Loan officers are offered a performance-based wage that has two main components – a fixed amount of US\$ 265 plus a bonus contingent on individual performance. The latter is calculated by a special formula, which combines stock indicators (portfolio size, number of borrowers), flow indicators (number of new clients), and *strategic ratios* (arrears, late payments). It cannot exceed 150 USD.

#### *Branch Performance*

The performance of a MFI can be easily evaluated by looking at the outreach and the sustainability achievements. One of the simplest indicators of outreach is the number of micro-entrepreneurs reached by the lender. At the end of 2000, only seven months after its foundation, Constanta 2 had over 1 600 active clients. In 2001 their number grew to 2 500.

**Figure II.3.** Constanta: Clients' portfolio development (2001)

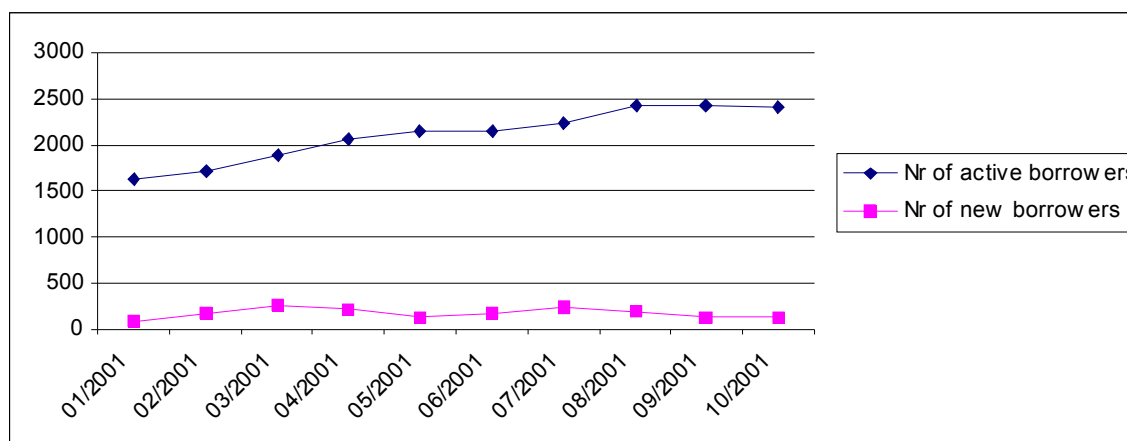


Figure II.3 illustrates two main trends in the development of the clients' portfolio. First, during the first ten months of 2001 the number of clients grew with around 48 percent. The growth, however, was not continuous. In August Constanta 2 reached the highest level of market satisfaction and since then the size of the borrowers' portfolio has not changed. Second, the majority of current clients (99 percent) proved to be repeated borrowers.

Another problem worth mentioning is the high level of administrative costs. For Constanta Georgia administrative expenses constitute 70 percent of the outstanding loan portfolio. Much better is the situation in the branch of Batumi where the expenses have been reduced to 45 percent. The aim of the management is to lower their level to 30% or even less. The most effective way to do it is to increase the loan portfolio by further geographical expansion.

Though the high administrative costs Constanta 2 was operationally self-sufficient during the whole year of 2001. Its financial independence, however, is difficult to be verified. According to the official financial analysis the financial break point was reached in August 2001 (Table II.3).

The problem comes from the fact that the operational income used in the calculations includes all donations and grants, which for the period between July and November 2001 constituted around 40% of the average performing assets. It is doubtful that Constanta 2 would have achieved these financial results having not been heavily subsidized by its donors.

Another important indicator of the performance of a lending organization is the repayment rate. The on-time repayment rates of Constanta 2 for the year 2001, defined as the collection on current amounts due divided by the total current amounts due, was between 98,91% (in

February) and 99,95% (in August). By the end of 2001 only 1,9% of all active borrowers were delinquent.

## **1.4 Microfinance Bank of Georgia**

### **1.4.1 Commercial approach in microfinance**

For nearly a decade NGOs have been regarded as particularly suitable to provide credits for micro and small businesses mainly because of their strong social commitment, high flexibility and the unconventional innovative approach. They have indeed managed to reach the target group of economically active poor individuals, and to distribute among them the funds obtained from various donor agencies. It is, however, questionable whether NGOs are able to supply their clients with long-term financial services and thus secure them the opportunity to obtain additional working capital whenever they need it. Most NGOs have failed to turn into economically viable institutions that are able to recover the initially disbursed funds and re-lend them over and over, thus enlarging constantly the breadth of the outreach. In order to survive and develop micro and small enterprises need access to credit on recurring basis. Such credit can be secured only by institutions, which are themselves stable, financially sustainable, and thus long-lasting. How to build such institutions is the core question for the proponents of the new commercial approach to development finance. They argue that professional financial institutions that are profit oriented and have lasting commitment to serving the target group are needed. Schmidt and Zeitinger [1996] point out the importance of an appropriate ownership and corporate governance structure. They favour an institutional structure that is “a healthy mix of public and private owners”. This structure should secure a balance of interests between the forces that are profit-oriented and those which prime goal is to serve the poor.

The next central issue in this context is the credit technology of the new institutions. Given the specific problems involved in lending to small and micro enterprises, the traditional “document-based” credit technology cannot be successfully employed. That is why a new non-conventional lending procedure has been developed. It includes some components that have already been largely used by the group lending microfinance organizations such as “prospective” lending and regularly repayment schedules. The central role, however, is given to the loan officers who are supposed to be the most important link between the bank and the borrowers. They bear full responsibility for the entire loan-granting process – screening, loan disbursement, monitoring, enforcement, repeated crediting. Their credit analysis relies on a thorough highly standardized assessment of individual borrowers, including both the business project and the household. The emphasis is put on the assessment of the borrower’s willingness to fulfil his payment obligations on time. The new bank requires from the clients to back the loan with collateral and tries to establish with them long-term relationships.

The commercial approach has been developed by experts in the field of microfinance who has been working together in the German consulting company Internationale Project Consult (IPC). In 1998 they started to implement their ideas by building a strategic partnership of



some commercial banks, IMI<sup>6</sup> and several well-known international donor and investment institutions, such as IFC, EBRD, DEG, FMO, and DOEN Foundation. The prime goal of the partnership was to build sustainable microfinance banks in developing and transition countries that would promote financial services to low-income people, focusing mainly on loan disbursements to small and medium enterprises. Nowadays such banks successfully operate in several countries in Latin America, Eastern Europe and the former Soviet Union. Among the pioneers was the Microfinance Bank of Georgia, which started its operations in May 1999.

#### **1.4.2 Foundation and ownership structure**

The Microfinance Bank of Georgia is an officially licensed banking institution. It started its operations in a quite difficult environment. The banking system in Georgia was highly inefficient. There was no inter-bank market; most banks were too small and under-capitalized; lending services were offered mainly to related parties; interest rates were set on inefficiently high levels. In the early 90s, due to the lack of clear regulation rules hundreds of banks were founded with capital of USD 500 or less. Only after 1995 the central bank started tightening supervision and encouraging consolidation by progressively raising the minimum capital requirements. In January 2001 the National Bank of Georgia fixed the minimum capital requirements at GEL 5 million, about USD 2,5 million. As a result the total number of banks has dropped from 294 in 1995 to 28 in 2001. Table II.4 shows the development of the financial sector in Georgia during the last five years.

On the Georgian banking scene MBG proved to be one of the very few stable banks. MBG's development in both lending and general banking business has been extremely dynamic. In 2000 the balance sheet volume reached 36.9 million GEL, or 18.7 million USD. The total net loans portfolio grew in comparison to 1999 by 320% and reached 24.7 million GEL (12.5 million USD). One and a half years after its foundation, MBG not only reached the operational break point but even achieved a small operational profit of 10.000 USD.

MBG's mission is to support private small and micro enterprises by providing financial services that are specifically tailored to their needs. The bank is strongly target and profit-oriented. Lending to micro and small businesses is its core business. The bank offers business and gold pawn loans in USD, Euros and Georgian Lari. At the end of 2000 its total gross portfolio amounted 25.7 million GEL, or 13 million USD. The business loans portfolio grew steadily and reached 23.6 million GEL.

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<sup>6</sup> Intranationale Micro Investition (IMI) is a development-oriented investment company founded in Frankfurt on July 6, 1998 by IPC and their employees.

The fast growth in the portfolio has been achieved through a rapid geographic expansion. Within less than two years five new branches started operating all over the country. In April 2000, MBG opened its first branch in the second largest city of Georgia, Kutaisi. It was followed by branches in Lilo-Samgori, Batumi, and the Gdiani and Vake districts of Tbilisi.

Due to its fast development MBG has become a main player in the Georgian financial sector. It counts to one of the five biggest banks measured by the loan portfolio. Its share of the total amount of disbursed credits to the private sector in Georgia grew from 1.9% in 1999 to almost 11% in 2001 (see Table II.5).

#### *Ownership structure*

MBG is an internationally owned target-oriented commercial bank. The initiators shared the idea that the new institution will both achieve its developmental objectives and be financially sustainable over a long term only if it is built as a mixture of private funds and donors' capital. The ownership structure of the bank is presented in Figure II.4:

**Figure II.4.** MGB: Ownership structure

Shareholder	Share of capital held
GGF/ KfW	20%
TBCBank	17%
IFC	16%
Commerzbank	15%
FMO	10%
EBRD	10%
IMI	10%
Others	2%
<b>Total</b>	<b>100%</b>

- Kreditanstalt fuer Wiederaufbau (KfW) is a German government-owned development bank, which has been providing financial assistance in Georgia since 1993.

- The IFC supports the development of the private sector in 135 developing countries worldwide. It started its activities in Georgia in 1997. MBG is one of the 9 Georgian projects the IFC is involved in.
- TBC Bank, established in 1992, is today one of the biggest and most stable banks in Georgia. From the very beginning it has worked together with a number of international organizations such as IFC, EBRD and DEG (a German state-owned development bank).
- FMO, the Dutch Development Finance Company, is a government-owned organization. It provides long-term financing to the private sector in over 70 developing and transition countries.
- IMI, a development-oriented investment bank, has already invested over 14 million Euros in microfinance banks in 15 developing and transition countries. Through its sister company, IPC, IMI provides also management services to MBG.
- EBRD, established in 1991, promotes entrepreneurial initiative in all Eastern and Central European Countries. So far, it has provided investments for more than 15 projects in Georgia.

### **1.4.3 The Batumi branch of MBG**

#### **1.4.3.1 Branch History**

Main interest for the proposed study constitutes the Batumi branch of MBG, where in the late autumn of 2001 an empirical survey among its clients was carried out. The branch was opened in March 2001. It commenced its operations with a flying start since the bank had already been widely advertised in the region, the staff had been trained, and the loan officers had managed to establish contacts with numerous local small and micro enterprises. The interest in the credit products of the bank was enormous. Most local banks focused on loans larger than USD 10,000, while the only NGO that provided microfinance services, Constanta, offered loans of a very small amount - up to USD 500. There was a large credit gap that has been successfully covered by MBG Batumi. Similar to the situation in Constanta, in the first months the credit demand was so high, that the loan officers worked with clients 12 to 14 hours a day.

### **1.4.3.2 Lending technology**

#### *Loan Terms and Conditions*

The bank provides only credits and Lombard services, which are given to officially registered or unregistered small and micro enterprises. Any kind of business is acceptable, except agricultural activities. The credit size ranges from USD 200 to USD 25.000. For credits exceeding this amount a special approval from the Head Office is needed. The interest rate varies with the credit size. For credits up to USD 5.000 it ranges between 2,5% and 3% monthly, and for credits over USD 5 000 it falls to 1,5% – 2 %. In contrast to Constanta, the monthly interest rate is calculated on the basis of the outstanding balance of the credit and not on the basis of the entire loan. Credits are repayable in equal monthly installments, and are backed by collateral, which value should equal or exceed 150% of the amount due (see Table II.6).

MBG Batumi applies the standard IPC credit technology, which is specifically designed for micro and small enterprises. It is based on proven know-how in the field of microfinance and has been successfully used in projects in Latin America, Africa and Eastern Europe.

As already mentioned, the most important link between the bank and the borrowers are the loan officers. They establish close personal contacts with the clients and bear the responsibility for the entire lending process – screening, monitoring, and enforcement. Their first task is to recognize the borrower's risk type and to analyse his repayment capacity. Since the majority of micro and small entrepreneurs cannot provide income-expense written records or balance sheets, the loan officers prepare a detailed cash-flow based analysis of the applicant's household and business. As a typical microfinance institution MBG does not separate the finances of the enterprise from those of the household and analyses them as a single, indivisible economic unit of revenues and expenses. Thus, the aim is not to evaluate precisely the client's assets, but to estimate his ability and willingness to repay the loan. Important part of the whole analysis is the psychological aspect. Most loan officers believe that crucial for their success is the ability correctly to analyse clients' personality. The smaller the credit size, the greater should be the importance of the psychological analysis. Vice versa, as the loan size increases, the significance of the psychological analysis diminishes at the expense of the financial analysis. In most cases, the repayment capacity of the applicant's business is estimated without taking into account the effects of the loan.

Next, loan officers determine repayment conditions that will fit possibly best the borrower's repayment capacity. The interest rate and the loan terms vary from client to client depending on the profitability of the business project and the client's ability to show his creditworthiness.

In order to reduce the screening and monitoring costs without jeopardizing the quality of the borrowers' portfolio, MBG tries to establish long-term relationships with the clients and respectively profit from their repeated credits.

### *Screening*

The credit process starts with a 15 – 20 minute talk in the offices of the bank. During this first interview the prospective clients give information about their business projects, purpose of the loan, sources of income, guarantees and collateral. It is also the first opportunity for the loan officer to both ensure that the applicant meets the bank's eligibility requirements and evaluate client's personal characteristics.

The second step the loan officer should undertake is to get additional information about the borrower. Batumi is not a big city and therefore it is relatively easy to find a friend, a colleague, or an established borrower who knows the applicant and can provide useful information about him, his family, and his business activities. Usually a 5 – 10 minute phone talk is sufficient for the loan officer to decide if to proceed further with a field visit or to terminate the relationship. In case of approval the loan officer visits both the working and living place of the client. The purpose of the home visit is to collect more detailed information about the family (the family size; age, occupation, and employment status of its members, etc.), and to estimate the value of the fixed assets. The loan officer insists to meet all household members and especially the spouse, in order to learn about the intra-family relationships, and to verify the family's ability and willingness to help with the repayment obligations in case of a business failure. The loan officer tries to evaluate the living conditions of the household, to select movable assets that can serve as collateral, and to collect the necessary documentation. At this stage, any documents that can back the credit are requested: paid bills, guarantee cards for TV sets, VCRs, radios, etc., title to the house, business documents.

During his visit to the applicant's working place the loan officer prepares a detailed cash flow analysis and a balance sheet. The analyses include revenues and expenses from all sources – sales, wages, relieves, pensions, business, and everyday household expanses (e.g. food, clothing, education). Particular attention is paid to business indicators such as weekly or monthly turnovers, incomes, and profits. Important for the preparation of the balance sheet is to properly estimate the values of the inventories. Other debts, if such exist, should be taken in consideration.

During his visits the loan officer and the client decide about the collateral. All MBG credits are highly collateralised. The value of the collateral should cover minimum 150% of the credit amount. MBG Batumi requires two collaterals – one that covers the whole amount due

(principle + interest rate) and the second one of much smaller value that covers 2 to 3 monthly installments. As second collateral the bank usually requires gold because it is highly liquid and can be sold within few minutes without suffering any additional transaction costs. The main role of the second collateral is to discipline current borrowers. The requirement to pledge gold as additional guarantee does not burden the local clients since most of them possess golden jewellery or golden coins. Adjara is a border area with Turkey and therefore for the local people keeping gold at home is a long national tradition. This requirement can be seen as a powerful self-selection mechanism that separates diligent from non-diligent borrowers. The credible threat of selling the gold in case of default discourages non-diligent borrowers from taking a credit. It, however, does not constrain individuals who expect to repay because they are willing and have the means to do so.

For credits up to USD 2,000 the bank takes as main collateral cars, TVs, VCRs, stoves, refrigerators, dining sets, and other household appliances. Loan officers try to include as many appliances as possible. For bigger credits, over USD 2,500, the bank requires as collateral a mortgage on the house. In these cases the value of the pledged collateral often exceeds the credit amount three, four to five times.

The last step in the screening process is the loan approval. Responsible for approving or rejecting credit applications is the credit committee, which consists of the loan officer, the Credit Manager, and sometimes the Branch Manager. Even though the credit committee takes the last decision, responsible for the credit is only the loan officer. The whole process, from the first contact to the credit disbursement, takes from three to seven days.

### *Monitoring*

Monitoring is not as costly and time-consuming as screening. It resembles the monitoring practice of Constanta. The main monitoring tool is the regular repayment schedule. Once per month the borrowers come to the bank office to pay their instalments and there they usually meet and talk to the loan officers. After the loan disbursement the loan officers may pay a visit to some of the borrowers, but it happens relatively seldom. Most of these visits are not pre-announced and have an informal character.

Another very effective tool of random monitoring is a casual phone call. It lasts 3 to 5 minutes. Loan officers merely ask about the family and the welfare of the household. Often they call just to congratulate the borrower with his birthday or to remind him/her of forthcoming installment payments. Important is not only to show to the clients that they stay under permanent control, but also to make them feel strongly linked to the bank, to make them identify themselves with the bank. That is why a prime goal of MBG is to create and maintain an excellent image among the entrepreneurs.

### *Repeated loans*

MBG's policy is to reduce the operational costs by building long-term relationships with the borrowers. The most expensive and time-consuming part of the lending process is the first in-debt credit analysis. With repeated lending, the input needed for the preparation of the credit analysis is significantly smaller and decreases with each credit cycle.

For repeated borrowers, a new evaluation is still needed. At this stage the most important indicator of client's creditworthiness is his repayment record (reputation). Before granting a second credit a new visit is recommended, so that the financial analysis could be updated. The main purpose of the visit is to learn how the funds have been allocated and if there is a change in the risk profile of the client. Loan officers are not concerned about specific uses of the funds but only about the overall riskiness of the project. They do not mind borrowers changing their business activities provided that this change does not negatively affect their productivity. Taking into account the specific features of the new project the loan terms and conditions are revised so that the repayment capacity of the borrower is not jeopardized.

### *Enforcement*

In case of delinquency the loan officers immediately call the client and if necessary pay him a visit. They try to find out the reason for the payment violation and warn the client about the consequences he is going to face. If the problem is easily solvable, the loan is restructured and a late repayment agreement is reached. If, however, the non-payment is a result of borrower's unwillingness to repay, the collateral is seized and stored at the branch. At this stage, the borrower still has the chance to recover the seized assets by repaying the amount due. If the borrower does not repay within the next few days, the collateral is finally sold and the bank restores its losses.

### **1.4.3.3 Performance**

#### *Loan Officers' Performance*

The credit technology described above implies that the bank's success entirely depends on the loan officers' skills and commitment. The simplest indicator of loan officers' efficiency is their borrowers' portfolio. The quantity of the portfolio could be measured by the number of clients per loan officer and/or the average loan amount disbursed. In 2001, twelve loan officers worked for MBG Batumi, each of them serving around 80 clients. This is an impressive achievement taking into account the complex screening and monitoring procedure. The average monthly loan portfolio per loan officer reached USD 206.000 in October 2001 (the time of the empirical investigation).

An appropriate indicator for the quality of the borrowers' portfolio is the repayment rate, which was 100% for all loan officers during the first seven months of MBG's operations.

The personnel policy of MBG is based on three main elements: careful selection, extended trainee program, internal promotion and performance-based remuneration. The bank is looking for recent or soon-to-be graduates from a university. The educational profile does not matter a lot. Banking or lending experience is not required. Rather, MBG is looking for flexible and motivated young people with highly communicative and analytical skills.

Before joining the bank the loan officers go through a special and highly standardized training program. All candidates attend first a two-week theoretical course, where they study the basics of the financial analysis; learn in details about the lending technology and institutional structure of the bank. Afterwards, each of them works in the field, supervised by an experienced loan officer.

The last pillar of the MBG's successful personnel policy constitutes of a system of monetary and non-monetary incentives. It includes a performance-based salary and promotion opportunities. To determine the loan officers' monthly remuneration MBG Batumi uses a dual system of fixed payment (USD 250) and incentive-creating bonuses. The latter are calculated by taking into account four indicators: portfolio size, total number of clients, number of new clients, arrears rate. The fixed payment is set slightly below competitive market levels (for comparison Constanta's fixed payment amounts USD 265). This small trick helps MBG to keep away employees whose only motivation for joining the bank is the money.

In addition, MBG offers to its employees attractive opportunities to make a carrier within the bank. The most productive loan officers are promoted first to Senior Loan Officers, then to Deputy Credit Managers, Credit Managers and sometimes even to Branch Managers.

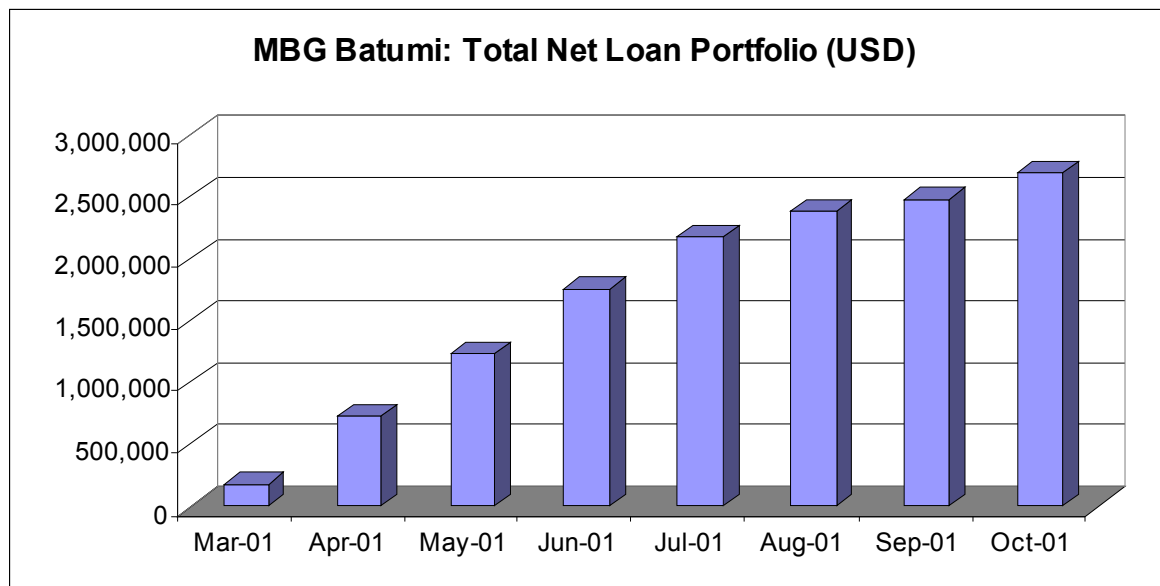


### *Branch Performance*

MBG Batumi is one of the most rapidly expanding banks in Adjara. It reached the operational break point only five months after its official opening in March 2001. The Branch managers' expectations were that in March or April 2002 the bank would become a financially independent institution.

At the time of our investigation the branch had over 1000 active borrowers and a total net loan portfolio of around USD 2.700.000.

**Figure II.5.** MBG: Financial Performance



Despite of being an important port and resort centre Batumi is not a big city and very soon, MBG will face the same problem as Constanta, namely the depletion of the served market niche. That is why the Branch management is concerned about the enlargement of the target group by introducing a new agricultural lending program.

## **2. Microfinance in Russia**

### **2.1 Microfinance Demand**

The socioeconomic development in the Russian Federation during the last 10 to 15 years does not substantially differ from that in Georgia. Transition to market economy turned out as a difficult and traumatic process for the population. It led to hyperinflation, decrease in GNP and national income. Society was divided into distinctive social classes. Poverty became one of the most pressing issues. In 1992, the year after the break-up of the Soviet Union, the income of one third of the Russian population fell below the poverty line mainly due to the abrupt price liberalization. Released from government control, consumer prices rose 1.345 percent in 1992. By the end of 1994, consumer prices were 2.000 percent higher than in December 1990. Although evidences of a market economy did appear, shock therapy's larger goals were not met. The applied set of reforms failed to facilitate a smooth transition to market economy, promote economic and political stability, and encourage long-term investments. On the contrary, it caused enormous social tension as the standard of living plunged, the rate of unemployment continuously grew, and the death rate drastically increased because of the inadequate social services and the lack of government control. Similar to the situation in Georgia, trained professionals (engineers, teachers, etc.) were forced to sell items on the street to support their families. People went for months without paychecks or pensions. Over the course of the 1990s, poverty became deeper and more severe.

With the growing number of social problems, the necessity of intensive micro-business development became more and more obvious. A number of independent surveys have shown that Russia has a great potential for such development. The new economic reality has drastically changed the mentality of the people by making them more business oriented, individualistic, rational, and self-reliant. It has been estimated that most of the poor individuals have education, which is high enough to start and successfully manage their own small businesses. Moreover, a great number of talented and highly skilled people live currently under the living wage but possess interesting ideas and are ready to implement them. What restricts their development is mainly the limited access to financial means. For the traditional banks, working with micro-business clients is too risky, takes excessive expenses, and in many cases proved to be non-profitable. As a result, about 70% of all Russian entrepreneurs have to use informal, often illegal, fund sources. The situation is even worse in distant regions and rural areas with higher concentration of poor people.

One of the ways to secure the needed resources for the micro- and small business is the fast development of a highly efficient microfinance sector. According to a survey conducted by the Russian SME (Small and Medium-Sized Enterprises) Resource Centre (2000) there are

three big groups of people in the country which demand microfinance services: individual private entrepreneurs with low incomes (around 2.5 million); micro-enterprises (610 thousand); and economically active poor population with entrepreneurial potential, including part of unemployed and low-paid individuals (at least 830 thousand). Thus, the total number of potential MFI clients exceeds 3 million people. The micro-loan portfolio should be increased to about USD 7 billion to satisfy the demand of all individuals interested in microfinance services.

## 2.2 Development of the Microfinance Sector

Nowadays five types of MFIs can be distinguished in Russia<sup>7</sup>:

- *Micro-lending Institutions (MLIs)*. These are specialized credit-only MFIs, that operate usually on a not-for-profit basis and are registered as NGO, Fund, co-operative or branch of a foreign NGO.
- *Credit Unions*. Membership organizations established with the aim of providing financial services to members that are fully, or largely financed from the share capital and savings of its members. Usually they have no access to any external finance.
- *Agricultural/ Rural Credit Cooperatives*. These are membership organizations, just like credit unions, dealing predominantly with farmers and agricultural related rural businesses.
- *Public Funds (Regional Funds)*. They operated under the auspices of the Regional government and are wholly or largely financed from the regional budget.
- *Commercial banks*. Program implementation through the Russian commercial banks is proceeded by the European Bank for Reconstruction and Development. It targets small and medium-sized enterprises and as a rule does not deal with micro-businesses.

For the purposes of the study presented in the thesis only the first type of MFIs is of interest. Most of the micro-lending institutions in Russia are externally (donor) funded NGOs. They usually utilize both individual lending and solidarity group-lending methodologies and secure their loans either through mutual guaranties or through alternative collateral (e.g. household appliances). The MLIs are not allowed to take deposits from clients. Savings can be pledged as cash collateral, but cannot be used for on- lending.

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<sup>7</sup> The description of the MFIs is taken from the study on improvement of access of small business to finance in Russia undertaken within the Tacis Project SMERUS 9803 "Support to the Development of Small Entrepreneurship".

On the territory of Russia, there are over 20 officially registered specialized MLIs. This section provides a short description of the five biggest and most influential ones.

### **FINCA – Samara Regional Microcredit Program**

FINCA was founded by the USAID in Samara in 1999. It applies a special group-lending approach, known as village banking. Village banking groups consist of five to ten neighbors, who mutual guarantee one another's loans, administer group-lending and savings activities, and provide mutual support if necessary. Groups meet weekly. No collateral is required. In 2002 the institution had around 43 thousand clients (73 percent of them women). The loan portfolio was over USD 12 million and the on time repayment was 98%.

### **Russian Women's Microfinance Network (RWMN)**

The RWMN was founded by Ford Foundation in 1998. Its mission is to support the development of women-focused microfinance institutions throughout Russia. The network has six partner MFIs: Kaluga Fund "Microloan" in Kaluga Region, "Women Initiatives" in Moscow Region, Fund for Support of Women Entrepreneurs in Tver Region, Fund for Support of Women Entrepreneurs in Kostroma Region, "Bryansk – Microloan" in Bryansk Region, and "Tula – Microloan" in Tula Region. All institutions apply individual lending methodology with collateral. The average loan term is two months, and the interest rate charged is 8 % per month. The ceiling for the first loan is USD 500. In 2002 the network had over 2 700 clients (73 percent of them women). The loan portfolio was over USD 2.5 million and the on time repayment was 97.4%.

### **Mobilizing Agricultural Credit (MAC) Program of ACDI/VOCA**

ACDI/VOCA is a private non-profit development organization in the US that is strongly connected to the agricultural co-operative movement. It administers the MAC program based on a three-year grant of USAID. Besides, it supports the Sakhalin Small Enterprise Development Fund, which is a group-lending MFIs aiming to support start-ups as well as existing MSEs that currently lack access to external finance.

### **Counterpart Enterprise Fund (CEF)**

Counterpart International started the Khabarovsk micro-lending program in 1998 with funding from the US - Russia Investment Fund and USAID. Its mission was to provide micro-entrepreneurs from the Russian Far East with access to credit at competitive, market-responsive rates and terms. It provided loans and technical assistance to more than 1.500 local entrepreneurs. The loan portfolio was approximately USD 1 million.

The largest and most influential MFI in the country is the Fund Opportunity Russia (FORA). This dissertation investigates in details FORA's lending technology and therefore a thorough description of its history, organizational structure, and lending mechanism is needed.

## **2.3 Fund Opportunity Russia (FORA)**

### **2.3.1 Foundation and Organizational Structure**

FORA was established by Opportunity International (OI) and its Russian Partners in July 2002. Opportunity International has been on the Russian market since 1993. Its aim has been to develop microfinance institutions mainly by providing them with financial means and helping them to adapt OI internationally proven lending methodology to the needs of the Russian micro-business.

FORA was formed by the consolidation of four of the five existing OI Russian Partners. Since its foundation it has been the leading MFI in Russia. Currently it operates in 11 regions (*oblasts*) of European Russia (Belgorod, Lipetsk, Nizny Novgorod, Novgorod-the-Great, Rostov-on-Don, Saratov, St. Petersburg, Penza, Pskov, Tambov, and Voronezh). The headquarters of the foundation are located in Nizhny Novgorod. The program has been funded by USAID, DFID (UK Know How Fund), UNHCR (United Nations High Commissioner for Refugees), TUSRIF (the U.S. Russian Investment Fund), the Eurasia Foundation, and the Charles Stuart Mott Foundation.

FORA's mission is to provide quality loan services to entrepreneurs who are striving to develop their businesses but lack collateral. FORA which closely follows the gender policy of Opportunity International targets predominantly women. The latter constitute over 70 percent of the client portfolio. Eligible to receive a loan are borrowers who are officially registered as entrepreneurs, have been engaged in business on a continuous basis for at least three months, have invested their own funds in fixed assets and goods in turnover. Loans are issued for development of three types of businesses:

- Retail and wholesale trade;
- Services (including intermediary and transport services);
- Production, except for agricultural production.

The majority of the clients are traders who need to increase their working capital in order to maintain or expand the businesses.

### **2.3.2 Lending Technology**

#### *Loan Terms and Conditions*

FORA offers two different loan products to their clients: individual loans and Trust Bank loans. Table II.7 provides detailed information about each loan type, including the loan size, loan term, loan security, repayment scheme, loan purpose, requirements, and interest rates.

As this study investigates the efficiency of the group-lending mechanism of FORA, I will proceed further with a description of the Trust Bank loans only. The Trust Bank methodology is a group-lending methodology used by the Opportunity Network worldwide since 1991. The Trust Bank is by definition a body with a minimum of 3 and a maximum of 9 borrowers who mutually guarantee each others' loans. Trust Bank members are self-selected based on the program's established criteria. Peer solidarity, peer monitoring, and peer pressure are expected to act as effective incentives for repayment. The loan terms and repayment schedules are flexible and as a rule depend on borrowers' needs and the income stream of their businesses. Loans are disbursed and collected simultaneously for all group members.

As can be seen in Table II.8, contrary to Constanta's practice, the interest rate in FORA is not fixed. It depends on the region in which the branch is situated. Main components for the interest rate calculation are cost recovery, risk factors and competitive considerations. The interest rate for Trust Bank programs should be greater or equal to commercial banks interest rate.

Second, the interest rate depends on the type of the loan, the loan cycle, and the size of the group. Table II.8 presents the algorithm of calculating the interest rate in FORA's hub "Perspectiva", Novgorod-the-Great.

Since one of the FORA's main goals is to stimulate the development of its group-lending program the interest rates of the group loans are considerably lower than the interest rates of the individual loans. As can be seen the price of the loan declines with the loan cycle and, in the case of group lending, with the growing number of group members. In addition, when a client attracts a new borrower in the group the interest rate of his loan is lowered by another 1%. In this way FORA aims to decrease the level of the administrative costs and thus improve its overall financial performance.

#### *Screening*

Similar to Constanta, the clients of FORA form their groups deliberately. In order to reduce the risk within the groups the following restrictions are imposed:

- No loans within a group are for the same businesses.

- Employees cannot take loans for their employer’s business.
- Members of the same family household cannot be in the same group.
- Start-ups should be included only in groups with members who have existing businesses. 75% of group members should already have existing businesses.

Loan officers are requested not to intervene with the process of group building but some violation of this rule have been observed<sup>8</sup>. As a rule, the members of the newly formed groups do not go through any training sessions. The loans are disbursed within 3 to maximum 5 days, which gives the institution big competitive advantages and considerably increases the value of the loans. At the same time, however, the simplified screening procedure does not incite more intensive communication between the perspective group members, resulting in building less homogenous groups (as it will be shown further in the empirical analysis, Chapter IV).

The loan officers use the period before the actual loan disbursement for collecting additional information about the applicants. Their main sources of information are current clients or applicants’ business partners and neighbors. Loan officers try to evaluate the financial risk of each group by paying a visit to all of its members. Loans are refused to groups consisting of borrowers whose expected future cash flow is not able to cover loan losses in case of a business failure of one (or more) of the group members.

The process of monitoring, repeated screening, and enforcement is identical to that in Constanta. Therefore, I do not provide here detailed description of it.

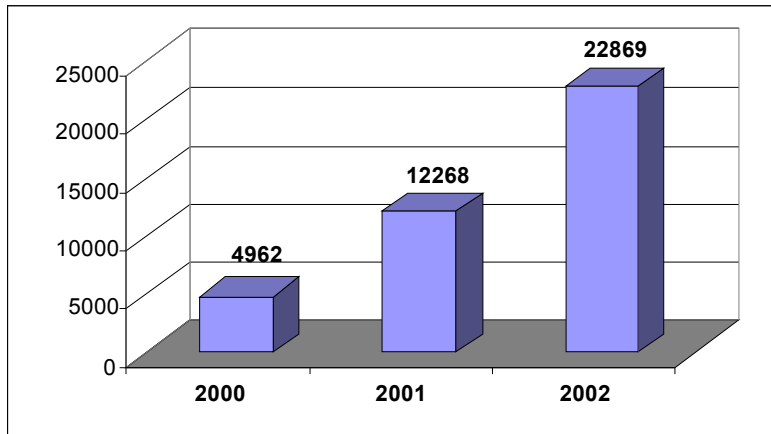
### **2.3.3 Performance**

The figures provided in this sub-section show a well distinguishable positive trend in the development of FORA. Since the beginning of its activity, the MFI has issued 42.980 loans for 38.67 million dollars. By the end of year 2002, the total number of active clients reached 10.788. The repayment rate is reported to be over 99 percent. An exact picture of the financial situation during the last 3 years can be found in the figures below.

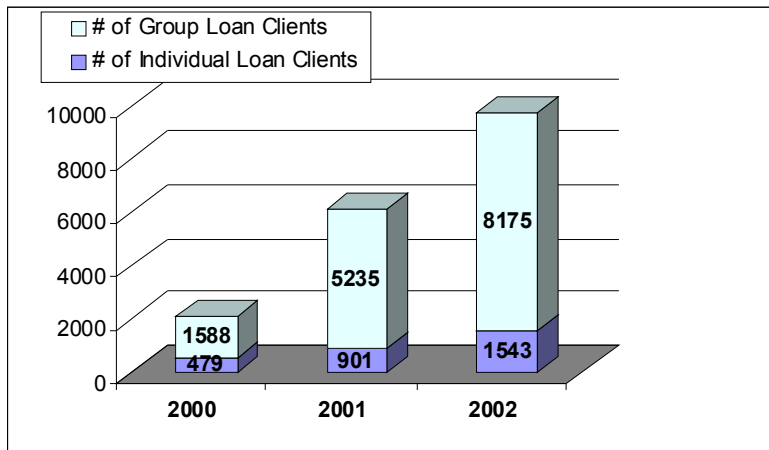
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<sup>8</sup> In some FORA’s branches, there were several incidences of violation of the rule when loan officers trying to reduce the administrative costs persuaded the members of several small groups to merge in the larger six- to seven-member groups. The newly formed groups often experienced severe coordination problems resulting in the eventual repayment failure on the group loan.

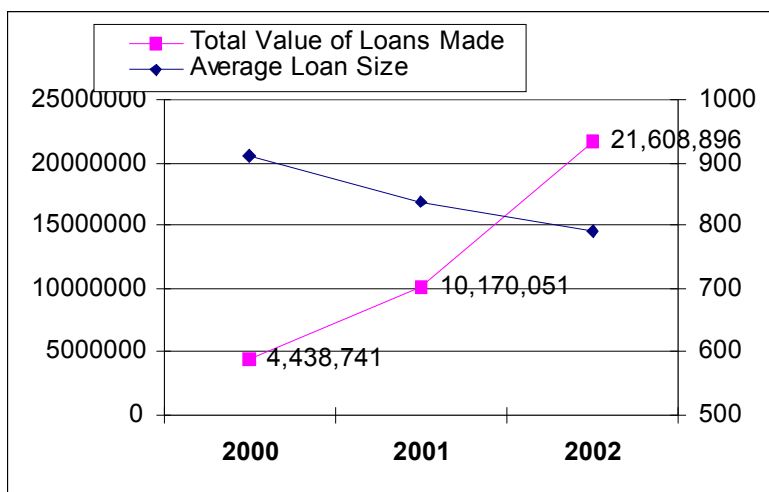
**Figure II.6. FORA: Number of loans disbursed**



**Figure II.7. FORA: Number of active clients**

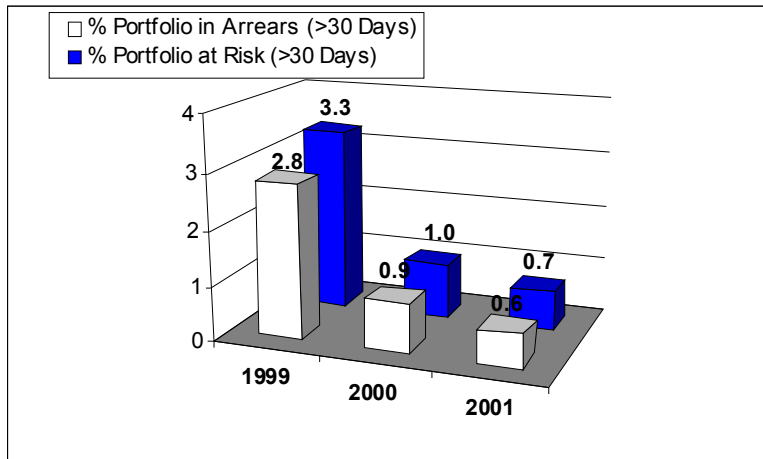


**Figure II.8. FORA: Value of loans disbursed (in US\$)**





**Figure II.9. FORA: Portfolio quality**



### III Micro-Lending Econometric Models

In the following chapter, I present the model used to study the dynamics of the micro-lending technologies. In particular, I define several hypotheses that summarize the research questions from Chapter I and propose for their testing a multi-stage econometric model. The model is built so that it replicates the two-stage nature of the principal-agent game: the stage where the borrowers are screened, i.e. before the contract is signed, and the stage where the repayments are enforced, i.e. after the loan disbursement.

#### 1. Group Lending

The analysis of the group-lending mechanism starts with a description of the process of group formation. Theoretical models (Ghatak [1999]) argue that the key factor of the group-lending scheme is that types similar with respect to their repayment risk will group together. Since it is difficult to measure each person's risk attitude, an individual's risk quality is approximated by the characteristics of the borrower's business project. I expect to find evidence of a positive correlation between the profitability of the business project of the surveyed borrower and the quality of his peers' business projects.

**Hypothesis 1:** The lower the borrower's investment risk, the better the quality characteristics of the business projects of his peers.

Turning to the second stage of the lending process, when loans are disbursed and have to be repaid, theory predicts that the group contract sets several direct and indirect incentives, which influence the repayment decision of each borrower. As shown in Chapter I dynamic incentives and the termination threat employ a direct reason to repay the previous loan. The credible threat to cut off any future loan and the positive incentive of having access to larger or cheaper loans in case of proper repayment already may induce borrowers to repay their loans without any peer measures. However, since borrowers are also jointly reliable and get only group access to future loans, the contract provides borrowers with an indirect incentive for peer monitoring, peer pressure, and peer support inducing borrowers to choose investments of low risk and to refrain from strategic default (Stiglitz [1990], Besley and Coate [1995] or Armendariz [1999]). Consequently, the lender should not face any moral hazard or enforcement problems. This leads to

**Hypothesis 2:** The repayment rate will significantly improve if peers (1) monitor each other more intensively; (2) impose stronger social sanctions; (3) show more willingness to provide

peer support; and (4) appreciate the opportunity to have access to subsequent loans and (5) to higher loan volumes.

The hypotheses are tested by designing a multi-stage econometric model that replicates the two-stage nature of the principal-agent game: the mutual screening process before signing the loan contract, and the mutual monitoring and enforcement process after the credit disbursement. The first stage is reflected by equation (1). The dependent variable, *group quality* ( $Y_i$ ), is an aggregate assessment of the group members' risk characteristics and can be seen as a proxy for the overall quality of the group. It has several ordered categories (high quality, intermediate quality, and low quality) and therefore an ordered logit model is specified in order to obtain the coefficient estimates.

$$\begin{array}{cccccccc}
 \boxed{\text{Group Quality, } Y_1} & = & \boxed{\text{Borrower's Risk Type, RT}} & + & \boxed{\text{Information, I}} & + & \boxed{\text{Education, E}} & + & \boxed{\text{Credit NeedCN}} & + & \boxed{\text{Relationship, R}} & + & \boxed{\text{PeerMonitoring, PM}} & + & \boxed{\text{Peer Pressure, PP}}
 \end{array}$$

$$\ln \left[ \frac{\sum_{k=1}^J P(Y_1 = j)}{1 - \sum_{k=1}^J P(Y_1 = J)} \right] = \alpha^j + \beta_1^g RT + \beta_2^g I + \beta_3^g E + \beta_4^g CN + \beta_5^g R + \beta_6^g PM + \beta_7^g PP$$

(1)

where  $j = 1, 2, \dots, J$  indicates the ordered categories in the dependent variable.

g – stays for “group-lending model”

The interdependence between  $Y_i$  and the first independent variable, *borrower's risk type* ( $RT$ ), enables the testing of hypothesis 1. In contrast to *group quality*, which shows the risk characteristics of the group,  $RT$  reflects the risk profile of an individual borrower. The two variables should be correlated if self-selection takes place. The lower the borrower's investment risk, the higher his requirements for the quality characteristics of his future partners in the credit group. Borrowers with profitable business projects will team with the economically most reliable partners out of the pool of prospective clients and vice versa.

The second independent variable, *information* ( $I$ ), indicates how well the borrower knew the business projects of his peers at the time the self-selection took place. In the theoretical literature on self-selection, it is often assumed that group members have perfect information about each other. If true the estimate of the coefficient should be insignificant.

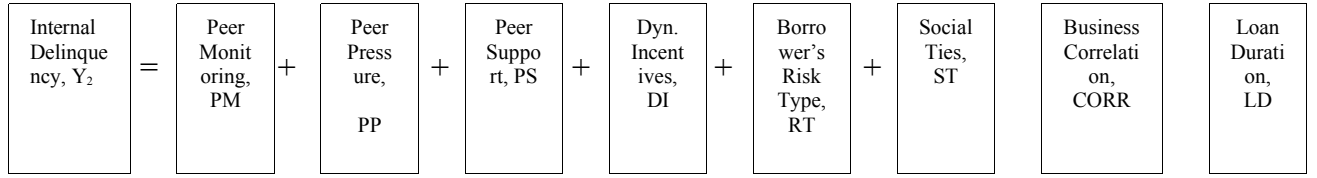
Variables *education* ( $E$ ), *credit needs* ( $CN$ ), and *relationship* ( $R$ ) show whether certain personal characteristics help the applicants enter a low-risk group.  $E$  stands for higher knowledge and better learning skills. The parameter coefficient would be positive if the

assumption holds that higher educated people become better entrepreneurs. *CN* indicates how much money the interviewed client would have borrowed assuming that there were no constraints on the loan size. I expect that agents who claim higher financial needs run businesses with greater potential for development in the long run. *R* shows whether the borrower has relatives or close friends among the group members. It enables me to investigate whether kinship or friendship provide any advantages to the applicants in the selection process.

The other exogenous variables – *peer monitoring (PM)* and *peer pressure (PP)* - test whether the groups of lower risk have internal rules that are stricter than the rules followed by the borrowers from higher risk groups.

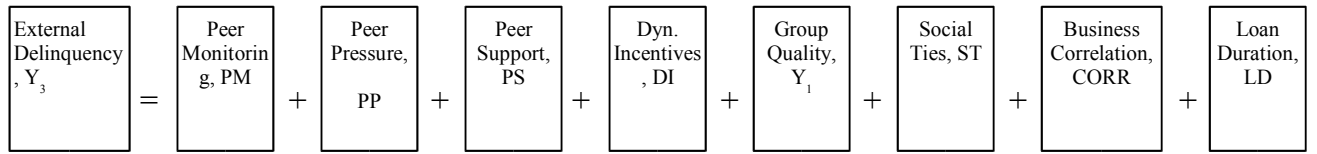
For testing hypothesis 2 the dynamics of the repayment mechanisms is taken into consideration. At the end of a lending period, when the returns of all projects are realized, the borrowers decide whether to contribute their shares of the total amount due. If all group members choose the same strategy, contribute or defect, the outcome is straightforward. The group repays or defaults. If the group members chose different strategies, they have to go through the second stage of the repayment sub-game. Those borrowers ready to contribute their shares need to compare the discounted benefits of having access to further loans with the cost of repaying the outstanding loan(s). Accordingly, they have to decide whether to pressure the delinquent partner(s) and force him (them) to repay. Alternatively, they have to decide whether to make up for the difference and exclude the defaulters.

In order to capture all aspects of the repayment mechanism two further equations are introduced. Equation (2) reflects the dynamics of the first stage of the repayment sub-game and shows all major factors that affect the internal repayment performance between members of the credit group. Equation (3) replicates the second stage of the repayment sub-game and reveals how the same factors contribute to the improvement of the external repayment performance between the credit group and the lender. Both dependent variables are dichotomous taking a value of 1 if there were no cases of internal respectively external delinquency in the group and 0 otherwise. To consider the effect of the independent factors binary logit models are specified.



$$\ln \left[ \frac{P(Y_2 = 1)}{1 - P(Y_2 = 1)} \right] = \alpha^g + \beta_1^g PM + \beta_2^g PP + \beta_3^g PS + \beta_4^g DI + \beta_5^g RT + \beta_6^g ST + \beta_7^g CORR + \beta_8^g LD \quad (2)$$

where  $Y_2 = 1$  if in the surveyed credit group there was no incidence of internal delinquency.



$$\ln \left[ \frac{P(Y_3 = 1)}{1 - P(Y_3 = 1)} \right] = \alpha^g + \beta_1^g PM + \beta_2^g PP + \beta_3^g PS + \beta_4^g DI + \beta_5^g Y_1 + \beta_6^g ST + \beta_7^g CORR + \beta_8^g LD \quad (3)$$

where  $Y_3 = 1$  if in the surveyed credit group there was no incidence of external delinquency.

The validity of Hypothesis 2 is verified by applying tests for parameter significance to the *peer monitoring (PM)*, *peer pressure (PP)*, *peer support (PS)* and *dynamic incentives (DI)* variables. The fact that nearly all the explanatory variables on the right-hand side of both equations are identical allows not only to test the hypothesis, but also to better understand the dynamics of the studied incentive mechanisms. For example, a statistical significance of the coefficient '*peer pressure*' in equation (2) would indicate the existence of a strong ex-ante pressure in the group. Individuals, aware of the consequences of default, will try to keep its probability at a low level, e.g. by putting their peers under pressure to invest in less risky projects. A statistical significance of this coefficient in equation (3) would reveal a strong ex-post peer pressure among the groups when they have been alerted to a repayment problem.

Further, the RHS of both equations contains four more variables that are expected to influence the borrower's repayment behavior. The *borrower's risk type (RT)* in equation (2) and *group quality (Y<sub>1</sub>)* in equation (3) are both expected to be correlated and are used to measure the quality of the borrowers' portfolio. Whereas the internal repayment performance is affected by the individuals' risk characteristics (approximated by *RT*), the external repayment behavior depends more on the characteristics of the complete group (approximated by *Y<sub>1</sub>*).

*Business correlation (CORR)*, the next independent factor shows to what extent the returns of the members' projects are linked to each other, for instance because of mutual trading activities, common clientele, common suppliers, etc. Its statistical characteristics indicate whether risk diversification matters, in the sense that the more diversified the borrowers' investments, the less the probability that all borrowers face simultaneous repayment problems due to external shocks.<sup>9</sup> *Social ties* reflects the homogeneity among the group members with respect to demographic and social characteristics, such as age, gender, income, etc. The last variable, *loan duration (LD)*, is thought to be an effective monitoring tool that helps the MFIs discipline the clients and gives the loan officers early warning about emerging problems.

## 2. Individual Lending

The individual micro-lending technology implies a direct credit analysis on the borrower's creditworthiness. Before signing the contract, individual lenders involve in an assessment of the borrower's business and household to identify the risk type of every potential client and, thus, to mitigate the adverse selection problem (e.g. Armendariz and Morduch [2000]). To evaluate the efficiency of this procedure I test

**Hypothesis 3:** The higher the loan officer's screening efforts, the higher the probability to recognize the risk type of a borrower.

After the loan disbursement, theory predicts that the MFI may rely on different incentives, such as collateral requirements, regular repayments, and the threat of excluding defaulting borrowers from the access to further and to increasing loans (cf. Stiglitz and Weiss [1983], Bolton and Scharfstein [1990]). In addition, earlier research (von Pischke [1991]) made clear that the repayment probability is also increased when households have different kinds of income. In particular, if the business project does not develop as expected (where dynamic incentives stopped to have any influence on the repayment ability) the chances of due repayment are the higher, the better the borrower's income is diversified. Moreover, Armendariz and Morduch [2000] show that the dynamic incentives will be weakened if competition between MFIs becomes increasing, at least if there is no credit rating agency. In order to estimate to what extent each part of this mechanism ensures that MFIs are able to sufficiently solve the moral hazard and enforcement problems, and to what extent these incentives are weakened by potential competitors, I define

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<sup>9</sup> A different argument is raised by Armendariz de Aghion [1999] who asserts that a high business correlation would guarantee better (if not excessive) monitoring, which reduces the probability of strategic default. This argument is in contrast to Krahnert and Schmidt [1994] insofar as they expect a lower repayment probability for a high business correlation, while Armendariz de Aghion [1999] expects a higher repayment probability.

**Hypothesis 2:** The higher a borrower values his collateral and the opportunity to establish a long-term relationship with the bank and the better the income of the borrower is diversified, the better his repayment performance will be.

The hypotheses are tested by constructing an econometric model that is analogous to the one introduced in the previous sub-section. Individual lending also follows a two-stage principal-agent model but exhibits different structure within both stages. At the first stage, the individual lending technology thanks to the increased screening costs allows the lender directly to recognize the borrower's risk type. The process is replicated in equation (4). The dependent variable,  $Y_4$ , reflects the default probability of the borrowers, which is denoted as 'risk type' (low risk, intermediate risk, and high risk). An ordered logit model is applied.

$$\begin{array}{c} \boxed{\text{Borrower's Risk Type, } Y_4} \end{array} = \begin{array}{c} \boxed{\text{Screening Efforts, SE}} \end{array} + \begin{array}{c} \boxed{\text{Written Records, WR}} \end{array} + \begin{array}{c} \boxed{\text{Industry Sector, IS}} \end{array} + \begin{array}{c} \boxed{\text{Education, E}} \end{array}$$

$$\ln \left[ \frac{\sum_{k=1}^J P(Y_4 = j)}{1 - \sum_{k=1}^J P(Y_4 = J)} \right] = \alpha^j + \beta_1^i SE + \beta_2^i WR + \beta_3^i IS + \beta_4^i E \quad (4)$$

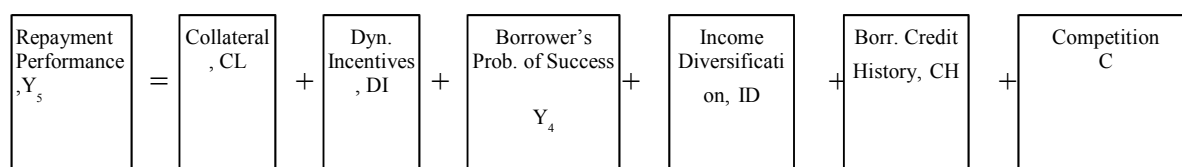
where  $j = 1, 2, \dots, J$  indicates the ordered categories in the dependent variable.

$i$  – stays for “individual lending model”

The equation reveals to what extent the individual lending technology is able to recognize the borrower's risk type if the loan officers' *screening efforts (SE)* are increased. The other exogenous variables, *written records (WR)* – a measure for the borrower's accounting skills, *education (E)*, and the *industry sector (IS)* of the client's investment activity, are easily observable. They allow to test whether the lender (using further available information) is able to better identify certain borrower types.

The second stage of the game is captured by a single equation only. Because of the more straightforward repayment procedure a single dependent variable, *repayment performance (Y<sub>5</sub>)*, is sufficient to reflect the whole repayment mechanism. As there were no cases of delinquency in the MBG Batumi at the time of the investigation, the repayment performance is measured as a ratio of the number of installments paid in advance over the total number of paid installments<sup>10</sup>. Accordingly, a tobit logit model is applied.

<sup>10</sup> For more details see Chapter 4.



$$Y_5 = \alpha^i + \beta_1^i CL + \beta_2^i DI + \beta_3^i Y_4 + \beta_4^i ID + \beta_5^i CH + \beta_6^i C + \varepsilon \quad (5)$$

Hypothesis 4 is tested by applying tests for parameter significance to the variables *collateral (CL)* and *dynamic incentives (DI)*. Further factors that are assumed to strongly influence borrowers' repayment performance are: *borrower's risk type (RT)*, the dependent variable of equation 4, *competition (C)* – availability of alternative sources of crediting; *income diversification (ID)* for the household, and *borrower's credit history (CH)*.

### 3. Individual versus Group Lending

Finally, the group vs. individual lending debate is addressed. I test the presumption that *ceteris paribus* borrowers prefer individual to group lending contracts. Micro-entrepreneurs may borrow from group-lending programs only if they do not have access to individual loans (e.g. they do not have any collateral to pledge or/and are not able to show their creditworthiness).

There are several reasons why individual lending contracts are supposed to be for the borrower superior to group-lending contracts. The last are usually highly standardized and offer the same loan terms and conditions to all clients without taking into account their individual needs.<sup>11</sup> In addition, group-lending borrowers may suffer increased transaction costs because of their obligations to participate in meetings, to be present for jointly signing contracts, to monitor their peers, and to impose social sanctions. Differently, the individual lending contracts are as a rule personalized: the loan terms and conditions can be tailored to perfectly match the client's demand and the enterprise cash flows. Besides, borrowers do not bear the risk of losses from extra payments when other group members fail to repay.

**Hypothesis 5:** If individual and group-lending organizations compete in the same market niche, the wealthier and the more productive borrowers, who can offer some form of collateral and run fast growing businesses, will choose the individual lender.

The influence of the wealth status is a variable which needs no explicit testing because a contract with MBG is only possible if the minimum requirements on the collateral are met by

<sup>11</sup> Some MFIs offering group loans have started to design more flexible loan products, cf. e.g. the so-called "Grameen 2" approach at the Grameen Bank.



a borrower. The second part of hypothesis 2 is tested by using equation (6). It will not be rejected if I detect significant differences in the business development between the clients of MBG and of those clients of Constanta who are able to pledge collateral.

$$\boxed{\text{Type of lending contract (Individual or Group), } Y_6} = \boxed{\text{Business Development, } BD} + \boxed{\text{Interest Rate, } IR} + \boxed{\text{Education, } E}$$

$$\ln \left[ \frac{P(Y_6 = 1)}{1 - P(Y_6 = 1)} \right] = \alpha + \beta_1 BD + \beta_2 IR + \beta_3 E \quad (6)$$

where  $Y_6 = 1$  if the borrower has an individual lending contract (is a client of MBG), 0 otherwise.

*Business development (BD)* reflects the development of the borrower's business project since the borrower received his first loan. I expect the borrowers with faster developing businesses to favor personalized, individual contracts.

The second independent variable, *interest rate (IR)*, measures the sensitivity of credit demand to interest rate. Expectations are that group-loan borrowers will be less sensitive to the cost of borrowing than individual loan borrowers, because the former ones basically need access to loans of a size where the credit cost in relation to the generated income are rather small. Marginal returns on the uses of these funds are higher than the cost of borrowing. The higher, however, the size of the loan amount (as in the individual loan contract) the more matters its cost in relation to the generated income. I, thus, expect that borrowers of very small loans (those who use group-loans) are not sensitive to changes in interest rates and that borrowers (who use individual loans) become more and more sensitive to changes in the interest rate as the loan amount is increased.

*Education* stands for higher knowledge.

The main presumption on which Hypothesis 5 is built states that *ceteris paribus* borrowers prefer an individual lending contract since it is better tailored to their needs. To complete the analysis I empirically test the presumption by defining

**Hypothesis 6:** Borrowers who signed an individual lending contract are more satisfied with the loan terms and conditions than borrowers who signed a group contract.

The hypothesis is tested by applying a *two independent-samples t-test for equality of means*.

## **IV Empirical Testing**

Here, the tests of the hypotheses defined in Chapter III are presented. The empirical part of the thesis starts with analyzing the dynamics of the group-lending technology by describing the multi-stage process of the group loan repayment in the MFIs Constanta and FORA. Next, the chapter presents the results of one of the first attempts to empirically investigate the efficiency of the individual micro-lending technology by studying the clients' behavior. The aim is to learn how the entire system of incentive mechanisms works and consequently to find out what factors do mostly help the MFIs solve the adverse selection, moral hazard, and enforcement problems.

After having described the key components of the two types of loan contracts the analysis proceeds with a direct comparison of the incentive mechanisms of the individual and the group schemes. The prime objective is to reveal the factors, which determine the choice of a lending contract.

### **1. Group Lending**

#### **1.1 Data Collection**

The data used in the analysis were obtained through borrower surveys. The group-lending questionnaire studies borrowers' socio-economic characteristics, the process of group formation, the group structure, and the intensity of intra-group activities. The questionnaire given to the borrowers of MBG has a similar structure but instead on group issues, focuses on the borrowers' interaction with the MFI. The questions tackling characteristics common for both the group and the individual lending methodology (e.g. progressive lending, repayment schemes, loan duration, etc.) are identical so that a direct comparison between the group and the individual schemes is possible (Appendix B and C).

All survey questions were close-ended, enabling the borrowers to give precise and unambiguous responses. The clients, being well educated, were able to independently fill in the questionnaires. When it was necessary, additional explanations by the interviewers were given.

The borrowers of the MBG and Constanta were surveyed simultaneously during the late autumn of 2001. The interviews were carried out in and around the City of Batumi, the capital

of the biggest Georgian autonomous republic, Adjara. Important to underline is that Adjara compared to the other parts of Georgia does not show significant economical and cultural differences.

In FORA, the interviews were carried out during the summer months of 2002. Questioned were 133 clients from four randomly selected cities: Lipetsk, Borisogletsk, Saratov, and Novgorod-the-Great. As the cities are located in different parts of European Russia – the South, the North, and the Central *rajons* – all possible regional differences have been taken into account.

For the purposes of the group-lending study, 236 credit groups from FORA and Constanta were surveyed. One randomly selected member from a group was questioned and his answers were considered representative for the whole group. To check the soundness of this approach in one of the Russian cities - Novgorod-the-Great - the target group was extended by simultaneously questioning two or more members per credit group. The comparison of the responses shows that, as expected, the borrowers who belong to the same group give similar descriptions of the group structure and the intra-group activities (e.g. peer monitoring, peer pressure, peer support, etc.)

## **1.2 Socioeconomic Characteristics of the Groups: Homogeneity Analysis**

The empirical part of the thesis starts with an analysis of the group-lending mechanism. It is assumed that the repayment behavior of the borrowers, their willingness to monitor each other, and the decision to support or sanction a delinquent peer depend to a high extent on the socioeconomic and demographic characteristics of the groups. Therefore, before testing the hypotheses it is important to get understanding of the group structure in the studied group-lending MFIs. The following section provides an extensive comparison of the degree of group homogeneity in terms of various socioeconomic indicators. The analysis is based on a simple descriptive statistics presented in Table IV.1 (App.A).

The table clearly shows that, in comparison to Constanta, FORA's groups are more homogeneous with respect to gender, age, education, and income. Especially striking is the difference in the homogeneity level with respect to the clients' income level. Only 2 percent of the Georgian borrowers reported to have the same income level as their peers. A possible reason for that could be the relatively large size of Constanta's groups. The bigger the number of the group members, the higher is the probability that at least one of them will exhibit different socioeconomic characteristics. Another explanation could be the fact that most of the Georgian borrowers did not know the exact income level of their peers and thus were not very

precise in their answers. Constanta's loan officers believed that their clients, despite of meeting nearly every day, had little or no information about each other's financial outcome (e.g. turnover, income, profit, etc.). Group members supposedly often share family problems but rarely discuss their business activities.

In contrast, about 45 percent of the Russian groups consist of entrepreneurs who have the same level of monthly income, suggesting that the peers are equally able to insure each other against external shocks.

FORA's groups also demonstrate higher similarities with respect to the members' age. Of the same age are the members of around 56 percent of the Russian groups and only 11 percent of the Georgian groups. Without further analysis, it is difficult to assert whether the differences in the age bring any advantages or, on the contrary, constitute rather a source of intra-group coordination problems. In the empirical data I could not find any statistical (either positive or negative) dependence between lenders' repayment rate and the degree of group homogeneity with respect to members' age.

In terms of group members' educational level, big differences within the groups of both MFIs have been observed. Further in the analysis, it will be shown that the level of education does not influence the probability of success of the individual borrowers.

Gender proved to be another very important issue in the field of micro lending. In this respect, FORA's groups again turned out to be more homogeneous having half of the groups formed solely by women whereas in Constanta their share does not exceed 36 percent. The official repayment statistics of the studied MFIs show that, on average, groups constructed only by women do not perform worse than do the mixed groups or the groups consisting solely of men. A more detailed analysis provided in Section 1.4 reveals interesting features of the women borrowers. Being highly volatile entrepreneurs, they run more often into internal repayment problems but at the same time proved more efficient in solving these problems independently before the loan is due.

Although both MFIs operate only in urban areas they do not face serious problems caused by the relatively higher clients' mobility. Thanks to the lenders' selection policy, the members of more than 80 percent of the groups have permanent residence in the borrowing region. With small exceptions, the cities where the MFIs operate are of small or medium size with a limited number of trading places (bazaars). It is thus unlikely that a client would succeed to take the money and disappear.

Group cohesion is assumed to be stronger when the interaction between peers goes beyond their business interests – kinship, friendship, participation in joint social activities, etc. In

Constanta, the members of 90 percent of the groups regularly meet for reasons not directly related to their businesses (e.g. to celebrate birthdays, weddings, public holidays, etc.). This, on the one hand, leads to increased mutual trust and loyalty but, on the other hand, considerably relaxes peers' vigilance, resulting in a poor ex-ante intra-group control (see Section 1.3).

Constanta's clients seem to build demographically more heterogeneous groups but at the same time demonstrate significantly higher social interaction within the groups. This finding is somewhat paradoxical but can be easily explained by the existing cultural differences. Georgians, as southern people, are believed to have a more intensive social life. Besides, as can be seen in Table IV.1, more than 20 percent of the interviewed clients claimed to have relatives (though not close) among the members of their groups. 30 percent of the groups are formed by friends and around 50 percent by borrowers who claim to be business associates. In FORA, half of the groups are built by friends, 5 percent by business associates, and around 44 percent by cosigners<sup>12</sup>.

It is assumed that the borrower's repayment performance is strongly affected by the degree of enterprise diversification inside the group because it determines how well the group members could insure each other in case of external shocks. Most of the groups in both MFIs consist entirely of petty traders, suggesting relatively high risk dependence among peers' businesses. The problem is more relevant for Constanta where the correlation across members' businesses in two of every three groups is reported to be strong or very strong. Changes in the macroeconomic or social environment affect in a similar way peers' investment returns, raising thus the probability of simultaneous default. The MFIs try to mitigate the problem by crediting only groups whose members have alternative sources of income in the family and/or sufficient household appliances to be sold in case of insufficiency.

The way the groups are built and the main characteristics of their structure determine to a high extent the dynamics of the group-lending mechanism. The next section discusses the borrowers' intra-group activities and analyses their impact on the repayment rate of the studied group-lending MFIs.

### **1.3 Hypotheses Testing**

In this section, I test hypotheses 1 and 2 and using the empirical results provide separate analyses on the efficiency of the incentive mechanisms employed by each of the group-lending MFIs. For this purpose, the econometric model developed in Chapter III is

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<sup>12</sup> With cosigners, I indicate group members who have nothing in common but the mutual responsibilities resulting from the joint-liability contract.

subsequently applied to the datasets of Constanta and FORA. The discussion starts with an analysis of the self-selection process in the Georgia MFI.

### 1.3.1 Constanta

#### 1.3.1.1 Testing the assortative matching proposition (hypothesis 1)

To study the dynamics of the lending technology of Constanta Foundation I make use of the econometric model presented in Chapter III. Descriptions and descriptive statistics on all key variables are presented in Table IV.2.

Starting with a test of the hypothesis about assortative matching it is assumed that borrowers use local information to self-select in groups, which are homogenous with respect to the investment risk. I test for homogeneity of the groups by regressing the variable *group quality* ( $Y_i$ ) on the variable *borrower's risk type* (see equation 1). *Group quality* indicates how the borrower evaluated the risk of the business projects of his perspective peers at the time the group was formed (a scale ranging from 1- "all businesses were quite risky" to 5- "all businesses were quite safe"). It is an aggregate assessment of the group members' risk characteristics excluding the interviewed borrower<sup>13</sup>. *Borrower's risk type* ( $RT$ ) reflects the risk profile of the interviewed borrower only. In order to avoid a self-assessment of risk attitudes by the interviewed persons, I approximate their risk by the characteristics of their business projects.  $RT$  is computed as a cluster analysis score using the following three indicators: 1) borrower's average monthly business income measured as an interval that ranges from 1- "up to 50 USD" to 5- "more than 200 USD", 2) development of the monthly income after the disbursement of the first loan (1- "decreased substantially" to 5- "increased significantly"), and 3) borrower's own assessment of the stability of his business project (1- "quite unstable" to 5- "very stable").

The borrowers were classified so that the resulting clusters exhibit high internal (within-cluster) homogeneity and high external (between-cluster) heterogeneity with respect to the three indicators. At each stage of the analysis, the two most similar respondents or clusters of respondents were combined into bigger clusters. The merging was stopped when a large

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<sup>13</sup> The variable can take five values, from 1- "all businesses quite risky" to 5- "all businesses quite safe", but in the survey none of the borrowers chose answers (1) or (2) - indicating high risk businesses (see also the comment on the label of the clusters). At first glance, this outcome raises the question of biased answers. However, there are good reasons to reject such conjecture. Firstly, as mentioned, the variable group quality is *not* a self-report of the risk-characteristics of the interviewed borrower, but an aggregate evaluation of the other group members. Secondly, the mere fact that there were almost no defaulting borrowers corresponds to the interviewee's assessment that his peers are not running any high-risk business.

increase in the average within-cluster distance was detected.<sup>14</sup> Three clusters were specified (mean values are shown in Table IV.3). The clusters are most clearly separated by the income level of the borrowers, which determines the ability of the entrepreneur to cover his installments, thus lowering the financial risk for the lending institution. I label the borrowers belonging to cluster 1 as “low risk” (24% of the interviewed borrowers), those from cluster 2 as “intermediate risk” (44%), and the rest (cluster 3) as “higher risk” (32%). In this context, it should be emphasized that there were no high risks among the borrowers. The label “higher risk” is only used for clear differentiation from the other clusters.

Coming back to hypothesis 1, the variables  $Y_I$  and  $RT$  should be correlated if self-selection takes place as expected by theory. The lower the borrower’s repayment risk, the higher his requirement for the quality characteristics of his partners in the credit group.

The second independent variable, *information (I)*, indicates how well the borrower knew the business projects of his peers at the time the self-selection took place (from 1- “no information at all” to 5- “detailed information about all projects”). As explained in Chapter III the coefficient estimates is expected to be insignificant.

Tests of significance on the variables *education (E)*, *credit needs (CN)*, and *relationship (R)* are used to check whether certain personal characteristics help the applicants enter low-risk groups. *E* shows the borrower’s level of education. It can take three possible values: 1- school, 2- college, and 3- university. *CN* is a metric variable indicating how much money the interviewed client would have borrowed assuming that there were no constraints on the loan size. *R* is a categorical variable with a value of 1 if the borrower has relatives among the group members, 2- if the borrower has close friends among the group members, 3- if the group members are business partners, and 4- if the group members are just cosigners.

The last two variables *peer monitoring (PM)* and *peer pressure (PP)*, test whether the internal rules in the good-quality groups substantially differ from the rules followed by the borrowers of the higher-risk groups. *PP* measures the group members’ willingness to sanction delinquent partners. It is a latent variable extracted by means of the factor analysis using the following variables<sup>15</sup>: (1) pressure the group (would) exerts on a delinquent member (answers rating from 1- “no pressure” to 5- “extremely strong pressure”), (2) sanctions the group (would) imposes on a delinquent member (from 1- “no sanctions” to 5- “immediate exclusion from the group”), and (3) sanctions the MFI (would) imposes on a defaulting group (from 1- “the group receives further loans but their size does not increase with time” to 5- “all group members are immediately excluded from the lending program”). The phenomenon of peer monitoring is

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<sup>14</sup> The merging of clusters was performed by using the Ward’s method. This method minimizes the Sum of Squares of any two (hypothetical) clusters that can be formed at each step. See also Hair [1998].

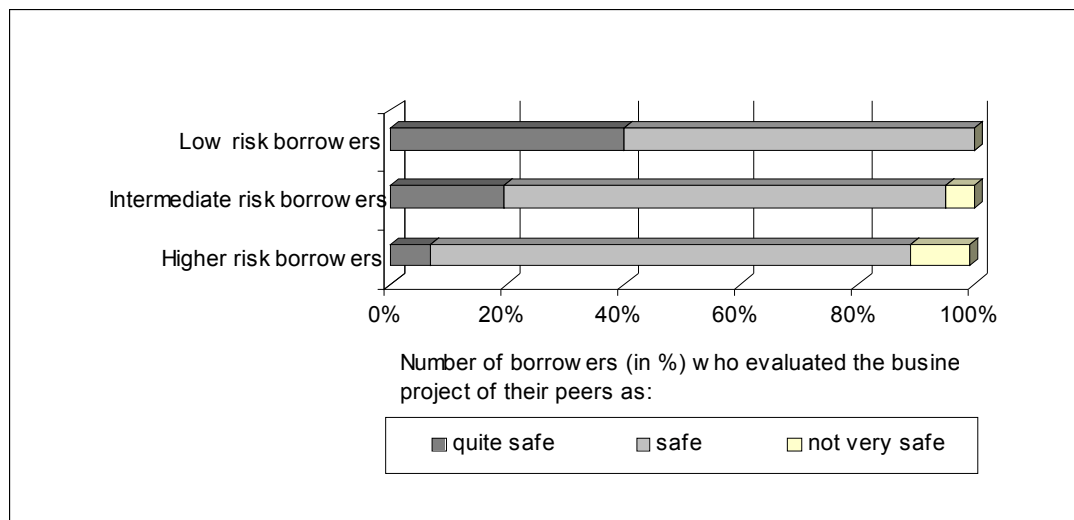
<sup>15</sup> See Appendix D.

presented by three variables indicating: 1) how often peers meet each other (1- “once a month” to 5- “every day”), 2) how often they discuss their business problems within the group (1- “never” to 5- “on a regular basis”), and 3) how well they know each other’s business outcome (1- “no information” to 5- “very detailed information”). In FORA’s dataset the variables being highly correlated load on a single latent factor, called *peer monitoring* (see Appendix D). In case of Constanta, however, the first two variables proved to be uncorrelated and therefore enter equation (1) as two independent factors, called respectively *monitoring (M)* and *peer control (PC)*.

The tests of parameter significance from the applied ordered logit model are listed in Table IV.4. The z-statistics are estimated using the White heteroscedasticity-consistent covariance matrix to calculate standard errors<sup>16</sup>.

*Borrower’s risk type (RT)* and *information (I)* proved to be the two variables significantly influencing the *group quality*. Figure 1 illustrates the first part of this finding by showing that the borrowers with lower risk characteristics have chosen partners with more reliable business projects. The significance of the second variable, *I*, makes clear that borrowers a priori do not dispose all necessary information about their perspective peers as assumed in theory. The other independent variables are statistically insignificant, showing that borrowers’ personal characteristics, such as the level of education, and the internal rules in the groups do not substantially influence the process of self-selection.

**Figure IV.1.** Constanta: Borrowers’ Self-Selection



**Result 1:** The group formation is influenced by the two variables *borrower’s risk type* and *information*. In favor of hypothesis 1, I found that lower risk borrowers, by making use of the

<sup>16</sup> C.f. White [1982].



local information which is also generated during the selection process and which is only available to them, indeed team up with lower risk borrowers and vice versa.

Since Result 1 is fundamental to the further analysis, an additional comment about the borrower risk groups is in order. In the next subsection, I will show that the risk characteristics of the business projects do not affect the repayment capacity of the clients. I also believe that, due to the borrowers' self-selection and the loan officers' screening efforts, no high-risk businesses received a group loan, thereby supporting the second theoretical result on assortative matching, namely that only low-risk borrowers should be attracted to peer group loans. The main difference between the borrowers who belong to different risk groups (clusters) proved to be their ability to support a delinquent partner, e.g. by covering at least part of the debt (see in particular Result 5): In the first cluster (low-risk borrowers) only 2.7 percent of the groups experienced external repayment problems, whereas in the second and third clusters (middle- and higher-risk borrowers) this share rises to 8.6% and 12.5%.

#### **1.3.1.2 Testing the efficiency of the applied incentive mechanisms (hypothesis 2)**

Turning to the second stage, the period after the loan disbursement, it is hypothesized that the group-lending mechanism gives borrowers either a direct incentive or - via the induced behavior of peer monitoring, peer pressure, peer support – an indirect incentive to choose investments of low risk and to refrain from strategic defaults, leading to a good repayment performance for the lender. In order to test the hypothesis and to gain further insights into the group dynamics, binary logit models were specified to consider the effects of different independent factors on the internal and external repayment performance (equations 2 and 3). The results are presented in Tables IV.5 and IV.6. As in equation (1) I use the White heteroscedasticity-consistent covariance matrix to calculate standard errors.

- *Internal Repayment Performance*

Table IV.5 shows the factors that influence the internal repayment performance. Repayment problems between the group members occurred in 24.1 % of the groups. These problems do not necessarily lead to violations of the repayment schedule and are not reported to the loan officers.

Starting with *peer support*, which is a dichotomous variable with a value of 1 if ceteris paribus borrowers prefer group to individual lending, I found that the group contract was preferred in about 30 percent of the groups. In these groups, all problems of internal

delinquency were solved independently (mostly by jointly supporting the delinquent partner). In comparison, only 60% of the groups with internal repayment problems whose members prefer individual lending managed to repay the entire debt on time. Approximately 65% did it by imposing sanctions on the defaulting member and eventually forcing him to repay, whereas the rest solved the problem by making up the difference.

The main reason for preferring the group-lending scheme was the borrowers' belief in the group's willingness to provide mutual help (in case of an external shock) either by temporarily covering their repayment obligations or by offering labor support. Borrowers, who faced e.g. health problems, reported that their peers partly covered the cost for the medical treatment and/or temporarily supported their businesses. E.g. if a credit group is formed by traders who have their workplaces in the neighborhood, the rest of the group displays the missing person's trading goods and serve his clientele. It should be underlined that this behavior is an economically well-calculated act. For low-income clients, it is more profitable to invest additional labor, ensuring the prompt repayment by the disabled person, than to use own financial means to cover his part of the debt.

Labor support usually prevents the occurrence of repayment problems and explains why clients who give preference to the group-lending contract belong to groups that could be labeled 'perfect payers'.<sup>17</sup> Vice versa, the absence of peer support in a group implies that each borrower have to manage his problems independently and thus increases the probability of failure. These considerations are fully supported by the empirical results:

**Result 2:** *Peer support* is statistically significant at 95 percent confidence level, proving that in groups with strong feelings of peer support, the probability that (at least) one person comes up with a repayment problem is much smaller than for those groups where the borrowers answered that they would prefer an individual lending scheme.

It is also interesting to analyze whether the willingness for peer support changes in the course of time when, according to earlier empirical evidence, more and more problems are expected to occur (due to potential mismatching). I measure the sensitivity of the group support to the loan cycle by separately applying the econometric model to two sub-samples of borrowers, one with three or less loans and a second one with more than three loans. *Peer support* is statistically significant only in the second sub-sample. An apparent conclusion of this result is that group support grows stronger in the course of time. The longer the borrowers stay in the group, the more they trust their peers, and the better they cooperate with them. This finding gives evidence of the viability of group lending and its ability to generate high repayment rates over a relatively long period. The results presented here are different to those of Paxton's

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<sup>17</sup> It should be further emphasized that these groups still preferred the group lending scheme even if they had experienced a repayment problem in their group.

(1996) investigation of credit groups in Burkina Faso with respect to the mismatching problem.

*Controlling* is the second significant factor. The variables *controlling* and *monitoring* were introduced to cover the phenomenon of peer monitoring<sup>18</sup>. *Monitoring* shows the frequency of meeting between the peers and is, thus, a proxy for the borrower's ex ante peer-monitoring efforts. On the one hand, this coefficient proves to be insignificant (p-value equals 0,556), thus evidencing the inefficiency of informal meetings in inducing repayments. On the other hand, it has to be emphasized that most group members know each other very well and meet nearly every day.<sup>19</sup> Even though, as Constanta's loan officers reported, the borrowers very seldom exchange information about their businesses (they reported that their clients had little or no information about each other's turnovers, incomes or profits<sup>20</sup>), the daily informal meetings of the borrowers might be interpreted as an implicit kind of monitoring that indirectly influences the individual incentives.

*Controlling* indicates how often the borrowers discuss their business problems within the group. The variable is highly significant (99%) but displays a negative value. To interpret this seemingly surprising result, I assert that for most of Constanta's borrowers, the exchange of business information is more a corrective measure than a preventive one.

**Result 3:** The more repayment difficulties arise in a group, the more intensive is the intra-group communication. At the MFI Constanta, the real state of the investments is verified if one of the group members declares inability to repay. *Controlling*, then, accounts for the borrowers auditing effort, through which the business conditions of the peers are analyzed.

- *External Repayment Performance*

Internal delinquency is an intra-group problem and does not affect the lender. If a group cooperates effectively, the MFI is usually not aware of all cases of internal delinquency because borrowers (driven by the incentive mechanism) may solve the problems within the group and may promptly repay the entire group's loan amount. By regressing the *external delinquency* on the independent variable listed in Table IV.6 I study those parts of the incentive mechanism that influence the repayment decision at the last stage of the repayment

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<sup>18</sup> My initial expectations were that *monitoring* and *controlling* would load on a factor that was a priori specified as a *peer-monitoring* factor. Both variables, however, proved to be statistically uncorrelated and were included into the model as two independent factors instead of a unique latent factor.

<sup>19</sup> 85,6% of the surveyed borrowers meet their peers every day, 2,1% meet them three or four times a week, 7,2% meet once or twice a week, and only 5,2% meet less than once a week.

<sup>20</sup> This opinion was fully supported by the survey data. To check empirically for the validity of the statement I regress the *monitoring* variable on the index measuring how well the borrowers observe their partners' project returns. The coefficient is insignificant with a p-value of .493.

sub-game. The explained variable is dichotomous with a value of 1 if there were no cases of external delinquency. The latter is defined as the failure of the group to pay the weekly installments on time. In the sample, the official repayment schedule was violated by 9.3 percent of the groups.

*Peer support*, *peer pressure*, and *group quality* are the variables that mostly contribute to the mitigation of the enforcement problem. The significance of *peer pressure* indicates that the probability of default is considerably smaller for groups whose members impose (or express their intention to impose) social sanctions.

**Result 4:** The variable *peer pressure* significantly improves the external repayment but does not influence the internal repayment performance indicating that most of Constanta's borrowers exert ex post pressure. They start taking action when a problem has occurred, a result confirmed by the negative sign of the *controlling* variable (significant at 90% confidence level with  $\beta$ -coefficient = -1,285).

It may be concluded that within the group-lending mechanism for Constanta's borrowers the central variable *preventing* internal delinquency (as well as mitigating the moral hazard problem) is *peer support*. All other variables are used by the borrowers as corrective measures, thus also solving the MFI's enforcement problem. Borrowers are not particularly concerned about their peers' business activities as long as there are no signals of a repayment failure.

A further factor - crucial for the success of the lender - is the self-selection process. Since the *borrower's risk type* proved to be not significant for the improvement of the internal repayment performance (see Table IV.5) I presume that most defaults occurred as a result of external, uncontrollable negative shocks and were not associated with the risk characteristics of the individual borrowers. However, the significance of the *group quality* variable in equation (3) evidences that groups consisting of middle risk borrowers are more likely to be delinquent than groups formed by low risk clients, calling for pressure by the peers and by the loan officers. This indicates that the low risk groups are better able to solve their internal repayment problems.

**Result 5:** Even though middle risk borrowers did not default more often than low risk clients they proved to indirectly jeopardize the repayment performance of the lender by showing to be less efficient in employing peer measures for solving intra-group problems.

A further interesting finding can be derived from a comparison of the statistical characteristics of the variables *self-selection* and *social ties*. The *social ties* variable is an index measuring the homogeneity of the groups with respect to age, gender, income, etc. The significance of

*self-selection* and the insignificance of *social ties* indicate that the lender's repayment performance can be improved only if clients build groups of similar investment risks. Other group characteristics have no impact.<sup>21</sup>

The last significant variable of the model is the *business correlation* factor. It measures on an ascending scale from 1 to 5 the degree of positive correlation across members' businesses, e.g. mutual trading activities, common clientele, common suppliers, etc. The a priori expectations about this variable are ambiguous, since there are two expectations: bad risk diversification and/or a higher capacity for mutual monitoring. In Constanta's case, it negatively affects the expected return of the lender:

**Result 6:** An increase in the (scale of) *business correlation* significantly raises the odds of a group default. A higher business correlation raises the probability that all group members will suffer the same negative shock. Regressing the *business correlation* variable on *monitoring* shows the coefficient to be insignificant (with a *p*-value of 0.698), indicating that peers with highly correlated businesses do not intensify their monitoring efforts in order to avoid paying the debts of their partners. This finding is consistent with the previous results since clients analyze the businesses of their group members only if a problem has occurred. Monitoring efforts do not vary with the degree of business correlation.

*Dynamic incentives* is the last incentive mechanism to be discussed here. It is a central factor in micro lending and is used by nearly all MFIs, including Constanta. The variable is computed as a factor analysis score that measures to what extent the borrower values the access to subsequent loans that are (1) of a bigger size, (2) at lower interest rate, (3) with longer terms to maturity, and (4) at lower transaction costs (App. D).

**Result 7:** In contrast to the general expectations raised in all theoretical models the variable *dynamic incentives* affects neither the internal nor the external repayment performance of Constanta's borrowers.

An explanation for this surprising result is that Constanta's clients, having very small, and only sometimes growing businesses, were not in need to utilize a stream of increasingly larger loans. To test if there is any correlation between the dynamics of borrowers' income flows (qu.45, App. B) and their demand for increasing loans (qu.30.1, App. B) I computed a Spearman' rho non-parametric test (Table IV.7): The two variables are positively correlated (at 0.05 percent significance level). The more dynamic the development of the business project is, the higher the borrower values the opportunity of obtaining subsequent loans of *higher* volume. However, many of Constanta's clients voluntarily refuse to increase their

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<sup>21</sup> These results are similar to the findings gleaned by Wydick (1999) during similar research in western Guatemala, where social ties proved to have no (or rather, a negative) effect on borrowing group behavior.

loans and borrow approximately the same amount in each loan cycle, showing that the access to further loans is a central issue, but not an increasing loan size. Most of them work with a very limited number of goods and cannot or do not want to broaden the assortment.

### 1.3.2 FORA, Russia

#### 1.3.2.1 Testing the assortative matching proposition (hypothesis 1)

In this section, the econometric model is applied to the data collected from 133 randomly selected groups of FORA. By analogy with the previous study, a test of the hypothesis about assortative matching is provided first. Detailed description of the variables can be found in Table IV.2. With some small exceptions, they are identical to those used in the analysis of Constanta's lending mechanism.

The results from the applied ordered logit model are summarized in Table IV.8. The provided test of overall model fit indicates the bad explanatory power of the whole set of independent variables. *Borrower's risk type* is insignificant, indicating that FORA's borrowers group randomly.

**Result 8:** There is no evidence of homogeneous matching in the FORA's groups. This finding could be partly explained by the short self-selection process (of only 3 to 5 days), as a result of which only a relatively small amount of initial information about the perspective peers is accumulated. Using the datasets of the two group-lending MFIs I measure the interdependence between the amount of initial information about the business projects of the future peers (qu.17, App. B) and the length of the selection process (qu.32, App. B). The statistical results show that the variables are positively correlated (at 95% confidence level) with a coefficient of .145

Whether the assumption of assortative matching holds depends not only on the endogenous process of group formation, but also to a very high extent on the screening policy of the MFI, e.g., whether it makes perspective borrowers attend training sessions during the selection process (Constanta) or use short straightforward screening procedure, thus stressing on the speedy disbursement of the loans (FORA). Except the freedom to independently choose their partners the borrowers also need sufficient time and encouragement by the loan officers to gather the necessary information about the future partners and subsequently to self-select in homogeneous with respect to the investment risk groups.

The fact that despite the differences in the process of group formation both MFIs have achieved repayment rates of over 99 % supports the proposition of Armendariz and Gollier (2000) that borrowers' assortative matching is not an absolutely necessary condition for the success of group lending. A deeper look at the survey statistics, however, reveals that it strongly influences the intensity and the efficacy of the intra-group activities: In Constanta where the borrowers match homogeneously 64 % of the groups facing internal repayment failures had managed to solve their problems before the weekly installments were due, whereas in FORA, their share does not exceed 6 percent. Even though FORA enjoys the same high repayment rate, its loan officers are obviously much more frequently confronted with late repayments. The further empirical analysis shows that most of the late repayments are eventually covered by the groups, evidencing the fact that heterogeneous matching does not necessarily destroy the system of incentive mechanisms. It, however, necessitate both more intensive peer control and more often redistribution of financial means inside the group, causing thus a rise in the costs of borrowing at the second stage of the lending process.

#### **1.3.2.2 Testing the efficiency of the applied incentive mechanisms (hypothesis 2)**

The instruments for managing the credit risk used by the studied group-lending MFIs are with some small exceptions identical. The impact of these instruments on the borrowers' behavior, however, proved to differ most probably due to the detected differences in the group formation and structure as well as the peculiarities of the cultural environment. The following section highlights the role of the incentive mechanisms created by the joint-liability contract in solving the delinquency problems in FORA, Russia. My aim is to show what motivates the clients to both invest the borrowed capital into safe projects and avoid strategic defaults.

- *Internal Repayment Rate*

The study proceeds with analyzing the factors that lead to the improvement of the repayment performance of individual borrowers. The empirical results from the specified binary logit model (equation (2)) are presented in Table IV.9.

To be consistent with the structure of the previous analysis I start the discussion with the *peer support* variable. Here the variable is measured in a slightly different way since during the interviews I found out that the main reason for many of the clients to choose the group contract was the fact that the group loans of FORA had lower interest rates than the individual ones. Therefore, I compute the variable as a score illustrating the willingness of the group to

pay for a delinquent member<sup>22</sup>. According to the empirical results listed in Table IV.9, it is statistically significant (at 90% confidence level) and positive.

**Result 9:** The loyalty towards the peers proved to be a strong incentive for the clients of FORA to repay their installments on time.

Further, I investigate how the strength of the peer support changes with time when the differences among the group members are expected to grow bigger, causing serious mismatching problems. The set of independent variables is regressed on the internal repayment performance of both the “new” borrowers (with three or less loans) and the “old” borrowers (with more than three loans).

*Peer support* proved to be significant only in the sub-sample consisting of new borrowers, evidencing that the belief in the group willingness to provide mutual help improves the repayment rate only during the first loan cycles and considerably diminishes afterwards.

The repayment rate of FORA could be expected to constantly decrease with time. According to the official financial analysis, however, on the contrary, it has been significantly improving for the last five years. Apparently, there are other incentive mechanisms, which help the MFI mitigate the moral hazard problem. Such a mechanism proved to be the *peer monitoring*. It is computed as a factor analysis score indicating 1) how often peers meet each other, 2) how often they discuss their business problems within the group, and 3) how well they know each other’s business outcome. The variable is highly significant and positive, evidencing that:

**Result 10:** The more intensively the peers monitor each other, the less likely is the internal delinquency. FORA’s clients effectively use the meetings to control their partners and reassure that the latter do not misallocate the borrowed capital.

The next significant factor is *social ties*. It is believed that the strength of the social ties between the group members strongly affects their behavior as well as their exposure to various problems. According to the theory, the repayment performance of a group should be better where the social ties between the members are strong since they increase the mutual trust and at the same time strengthen the impact of the imposed social sanctions

**Result 11:** *Social ties* negatively influence the repayment willingness (or ability) of both individuals and groups: The variable is statistically significant with a negative coefficient in equation (2) as well as equation (3). To explain this phenomenon I assert that in socially

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<sup>22</sup> In Constanta’s database, the willingness of the group to pay for a delinquent member is highly correlated with the willingness to exert peer pressure and to impose social sanctions. In the case of FORA, on the contrary, the willingness to pay for a delinquent member is statistically independent from the other two variables, allowing me to include it into the model as an independent factor.



homogenous groups individuals strongly rely on peers' unconditional support and are thus more likely to ride free.

In most FORA's groups, the willingness for mutual financial support (*peer support* significantly improves both internal and external repayment performance) substantially increases the chances of a delinquent borrower to be refinanced by the lender despite his repayment failure. However, as the empirical results show, borrowers not only explicitly express their intention to support their peers but also effectively monitor them (peer monitoring is statistically significant at 95% confidence level), thus sufficiently raising the probability of discovering the real reason for the default. Thus free riding, being very likely to be discovered, often creates tension and mistrust among the group members, resulting in a group refusal to cover the debt of the fraud (explaining the negative sign of the coefficient in equation (3)).

Except joint liability, the majority of the group-lending MFIs use also other mechanisms that are expected to discipline the borrowers and thus improve the repayment performance. One of them is the shorter term of maturity. It is thought to be an effective monitoring tool, especially in the first loan cycles. Longer loans are considered to be riskier since they have more chances to fall into arrears and lead thus to greater delinquency rates.

To examine the role of the loan duration I slightly extend the econometric model by adding to equations (2) and (3) a new variable called *loan duration*. The modified model is applied only to FORA's database because Constanta offers to all clients only one type of a loan contract, where the time to maturity is fixed at exactly 4 months. FORA's lending procedure is more flexible in the sense that it allows the loan duration to vary from client to client in accordance to their cash flows. It ranges from 4 to 12 months.

**Result 12:** *Loan duration* is statistically significant (at 90% confidence level) and, as expected, displays a negative sign ( $\beta$ -coefficient = -0,617). The longer the term to maturity, the more difficult it is for the borrowers to meet the repayment obligations.

The last to be discussed is how the risk characteristics of the borrowers affect their repayment behavior.

**Result 13:** *Borrower's risk type* is statistically insignificant, suggesting that the highest-risk applicants, who are usually also the lowest-productivity entrepreneurs, decide to stay (or are left) out of the market.

- *External Repayment Performance*

Though all precautions measures some borrowers fail to fulfil on time their repayment obligations. Repayment problems occur as a result of both external uncontrollable shocks and clients' carelessness. Notwithstanding the reason, the credit groups are expected to always repair the individual's failure either by covering his part of the loan or by imposing (social) sanctions and thus forcing him to repay. This sub-section reveals the factors that mostly influence the repayment performance of FORA's credit groups. Whether the groups repair the repayment failures of individual borrowers and what kind of peer measures they use is studied by regressing the *external repayment performance* on the specified set of independent factors (equation (3)).

The empirical results listed in Table IV.10 reveal substantial differences between the MFIs FORA and Constanta in terms of the intra-group behavior of their clients. The most controversial factor seems to be *peer pressure*. The variable is statistically significant in both samples of borrowers but the coefficient takes different signs. In FORA, the variable surprisingly shows a negative coefficient. I assert that willing to sanction a delinquent member are only clients who belong to groups that have already been at least once in arrears. These are mainly groups where the tension between the peers is very high since they have not managed to solve successfully their internal problems.

**Result 14:** The clients of FORA (different from those of Constanta) rarely use peer pressure for inducing repayments. They rather employ it at a later stage - after they have paid for the delinquent partner - in order to be compensated for the losses.

Instead, the most efficient incentive mechanism for tackling the enforcement problems in FORA turned out to be the willingness for mutual help.

**Result 15:** *Peer support* is the only statistically significant and positive variable in equation (3). The group serves as a secondary repayment source for the clients and thus preserves the lender from suffering losses due to repayment failures.

However, as it was mentioned in the previous sub-section, borrowers are more willing to pay for their peers in the first loan cycles than in the subsequent ones. This finding holds also when the sensitivity of the group support to the loan cycle is measured with respect to the external repayment performance. Peer support will thus repair the failures of the borrowers only to a certain time point.

The last to be discussed is the negative impact of the high business correlation across the group members. As already mentioned FORA serves predominantly petty traders. As a result, most of the groups are homogeneous with respect to economic activities and/or risk exposure.

The latter is measured by the variable *business correlation*, which proved to be significant (at 95% confidence level) with a negative sign of the parameter ( $\beta$ -coefficient = -0,525).

**Result 16:** High business dependence across members influences negatively the repayment performance of a group, clearly showing that it substantially weakens the peers' ability to mutually insure each other when external shocks arise.

A more detailed analysis shows that the higher business correlation does not induce excessive peer monitoring since, similar to Constanta, the variables *business correlation* and *peer monitoring* proved to be statistically independent ( $p=0.411$ ). Obviously, the factor has a similar impact on both Constanta's and FORA's clients.

## 1.4 Analyzing the Influence of Further Variables

Up to now, I have focused mostly on investigating the role of the peer activities induced by the principle of joint liability in driving high repayment rates. Due to difficulties in assessing each person's risk attitude the risk quality of the borrowers has been measured in the analysis by the quality of their business projects only. However, because of the high vulnerability of the borrowers' tiny businesses their repayment performance strongly depends also on factors that are not directly associated with the risky project. I assume that there is a set of borrower-specific and group-specific characteristics, which further determine the clients' willingness to repay the loan as well as their ability to manage external unexpected shocks. In this section, I aim to verify (1) which of these characteristics influence the probability that a group will run into internal and/or external repayment problems and (2) to what extent these characteristics can help the MFIs recognize the groups that are most likely to independently solve repayment problems.

### 1.4.1 The Econometric Model

To answer the research questions I build a simple econometric model of three equations:

where

$$h = 1, 2, 3.$$

$g_1 = \text{logit}$  (probability of experiencing internal delinquency versus experiencing no repayment problems),

$g_2 = \text{logit}$  (probability of experiencing external delinquency versus experiencing no repayment problems),

$g_3 = \text{logit}$  (probability of solving an existing repayment problem versus defaulting).

The first two equations attempt to measure the weight of independent variables determining whether or not a group will run into internal respectively external repayment problems. The third equation examines the characteristics of those groups, which had experienced repayment problems but had managed to solve them before the payment was due.

To calculate the coefficients a multinomial logit model is applied. The dependent variable has three categories that represent the three different types of credit groups: *accurate payers*, *problem solvers*, and *defaulters*. *Accurate payers* are groups that have never experienced any kind of repayment problems. Groups that had experienced internal problems, but were still

able to repay the loans on time, are labeled as *problem solvers*. MFIs often cannot distinguish between these two types of groups. Finally, to *defaulters* belong groups that have violated at least once the official repayment schedule.

By using a polytomous nominal variable as a dependent factor I can compare in succession (1) accurate payers with problem solvers, (2) accurate payers with defaulters, and (3) problems solvers with defaulters.

$$\ln \left[ \frac{P(Y = h)}{P(Y = 3)} \right] = \alpha^h + \beta_{1j}^h \sum X_j + \beta_{2i}^h \sum Z_i,$$

where  $h = 1$  (accurate payers), 2 (problem solvers), 3 (defaulters), and

$$P(Y = 3) = 1 - P(Y = 1) - P(Y = 2).$$

The set of explanatory variables contains various personal (X) and groups' (Z) characteristics (Table IV.11). Together with *education* and *borrower's credit history* (1 if the client reported to have borrowed money for business purposes before joining the group-lending program, 0 otherwise), the X-vector includes the variables *household income diversification*, and *collateral*.

*Household income diversification* is a dichotomous variable taking a value of 1 if the borrower has alternative sources of income. Most MFIs do not differentiate between borrower's enterprise and household but analyse them as a single, indivisible economic unit of revenues and expenses. Therefore, the availability of alternative sources of income in the household is considered as a kind of insurance against delinquency in case of a business failure. Thus I expect the variable to have a positive impact on the repayment performance. *Collateral* is a dummy variable indicating whether the client had the necessary assets to pledge as collateral in case such was required. It approximates the clients' level of wealth. The wealthier the client is, the higher the probability that he will find the necessary financial means to repay the loan on time (negative impact on delinquency rate). On the other hand, however, wealthier borrowers are assumed to have easier access to alternative credit sources, undermining one of the strongest repayment incentives in microfinance (positive effect on delinquency rate). Thus, the net effect of the variable on the delinquency rate cannot be determined in advance. *Competition* approximates the probability of being re-financed by another financial institution. The greater the likelihood of being refinanced by a second lender, the weaker is the incentive to repay to the first one.

The Z-vector consists of two variables: *group size* (number of borrowers in the group) and *gender*. In bigger groups, the incentives for peer monitoring diminish since the time and the efforts invested in controlling the peers increase. On the other hand, however, in bigger

groups the likelihood that the debt of a defaulting member will be covered rises since the costs to each borrower resulting from a single person's default decrease. Which of these two factors prevails can be verified by applying the proposed model. The last variable, *gender*, takes two possible values: 1 if the group consists entirely of women and 0 otherwise. It allows investigating whether lending to women brings any financial advantages to the MFIs from the region.

#### 1.4.2 Empirical Results

Table IV.12 presents the empirical results. The coefficients were estimated by combining the observations from the two surveyed MFIs. The big similarities in the macroeconomic situation, social conditions, and educational system in the most former Soviet republics allow for generalizing the findings. The White heteroscedasticity-consistent covariance matrix was used to calculate the standard errors.

From the whole set of independent variables only three significantly contribute to the separation of the groups into accurate payers, problem solvers, and defaulters: *collateral*, *gender* and *group size*. Looking at the first two columns of the table I discovered an interesting fact, namely that exactly the two variables – *collateral* and *gender* - that proved to be responsible for the occurrence of internal delinquency (statistically significant and positive in column 1) helped the problematic groups to overcome their repayment difficulties (statistically significant and positive in column 2 as well). Groups consisting solely of women have higher probability to run into repayment problems but at the same time, their members demonstrate better abilities to solve the problems before the loan is due.

Similar conclusions can be drawn in terms of *collateral*. On the one hand, groups with at least one member being able to pledge collateral are more likely to experience internal repayment problems, showing that in relatively wealthier groups the temptation to ride free is stronger.<sup>23</sup> On the other hand, however, exactly these groups proved to cover with higher probability the repayment failures of their members. In case of internal delinquency the collateral is most probably used as a secondary source of repayment.

**Result 17:** These findings clearly show that group lending is, as stated in the theoretical literature, indeed able to repair the market failures. Group-lending MFIs can successfully lend to clients who proved to be very risky. The delinquency rate of the surveyed borrowers would

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<sup>23</sup> Since I do not know which of the group members failed to repay – those with collateral or those without collateral – I cannot estimate whether the reason for the default was the borrower's belief that his wealthier peers would cover his part of the debt, or the confidence of the collateral owner that (having the necessary means) he would be able to easily get access to other sources of credit.

be much higher if the MFIs used an individual lending technique. Low-income women, for example, would be most probably left out of the credit market or if not they would burden the MFI with higher arrears, jeopardizing thus its financial sustainability.

*Group size* is the last factor that seems to considerably influence the groups' default status. It is negative and statistically significant in columns 2 and 3. The smaller the group, the higher is the probability of default. However, by looking more deeply into the data I found that the significance of the variable is a result of the fact that more than 70% of the *defaulters* are groups of FORA. The last consist of 3 to 9 micro-entrepreneurs and are twice as small as the groups of Constanta (see Chapter 2). Thus the finding does not allow me draw any plausible conclusions about the optimal group size.

## **1.5. Discussion on Group Lending**

### **1.5.1 Adverse Selection**

The group-lending mechanism proved to be highly efficient in inducing on-time repayments in both MFIs even though substantial differences in the way it works in different settings were detected. By investigating the process of group formation I found that to give the applicants the freedom to independently self and co-select does not automatically lead to assortative matching. The latter occurs only if the clients are deliberately encouraged (or even forced) by the loan officers to gather detailed information about their future peers. According to the empirical results, such approach – applied in Constanta – indeed helps the lender alleviate the adverse selection problem but requires a long selection period (about 2 weeks). In a high competitive environment, the slow screening procedure is known to impede the growth of the credit institutions as it makes them less attractive for the entrepreneurs. In this context, the finding that the group-lending mechanism induces prompt loan repayments even when borrowers group randomly (FORA), is of a big practical importance. The lack of sufficient initial information, however, leads to higher borrowing costs at the second stage of the lending process when borrowers intensify their monitoring efforts and more often redistribute financial means inside the groups.

Another interesting finding is the fact that the borrowers' repayment performance is not directly influenced by the degree of risk exposure (measured by the level of productivity). This indicates that even the riskiest type of entrepreneurs selected into the programs does not jeopardize the repayment performance of the lenders. The selection mechanism secures that the applicants with bad risk characteristics are left out of the programs.

Further, it was shown that the MFIs, using easily accessible information, are not able to verify the degree of riskiness of borrowers' business projects. They, however, can improve the quality of the clients' portfolio by imposing restrictions towards the newly formed credit groups and adjusting some institutional regulations that aim to control the composition of the groups (e.g. limitations on the group size). The dissertation presents a model that can be used to fine tune lenders' screening procedures and thus build stronger and more sustainable institutions. The model examines how some borrower-specific and group-specific characteristics, which are not directly connected to the risky projects, influence both the individual and the group repayment decisions.

The empirical findings justify the MFIs' target policy of favoring women micro-entrepreneurs. By serving predominantly women, the lenders achieve stronger social impact without jeopardizing their financial soundness. On the one hand, groups consisting entirely of women experience more often internal delinquency, suggesting that in the studied region women are economically more volatile<sup>24</sup>. On the other hand, the female groups proved to be more likely to independently solve their internal problems, demonstrating that the women have better developed sense of group solidarity.

The further findings evidence the limited risk-sharing abilities of the target micro-entrepreneurs. Delinquent groups, which do not possess secondary repayment sources, such as collateral, for example, often proved to have insufficient capacities to cover the joint-liability payments in case of a single member's failure. Another serious problem for the MFIs is the high business correlation across group members' projects returns. It makes groups less prone to external shocks and thus jeopardizes lenders' high repayment rates.

### **1.5.2 Moral Hazard and Enforcement Problem**

The following sub-section provides a short analysis of 1) the peer measures taken by the borrowers after the actual loan disbursement, and 2) the factors, which do not directly result from the joint-liability principle but which are regarded to be a necessary condition for the successful application of the mechanism.

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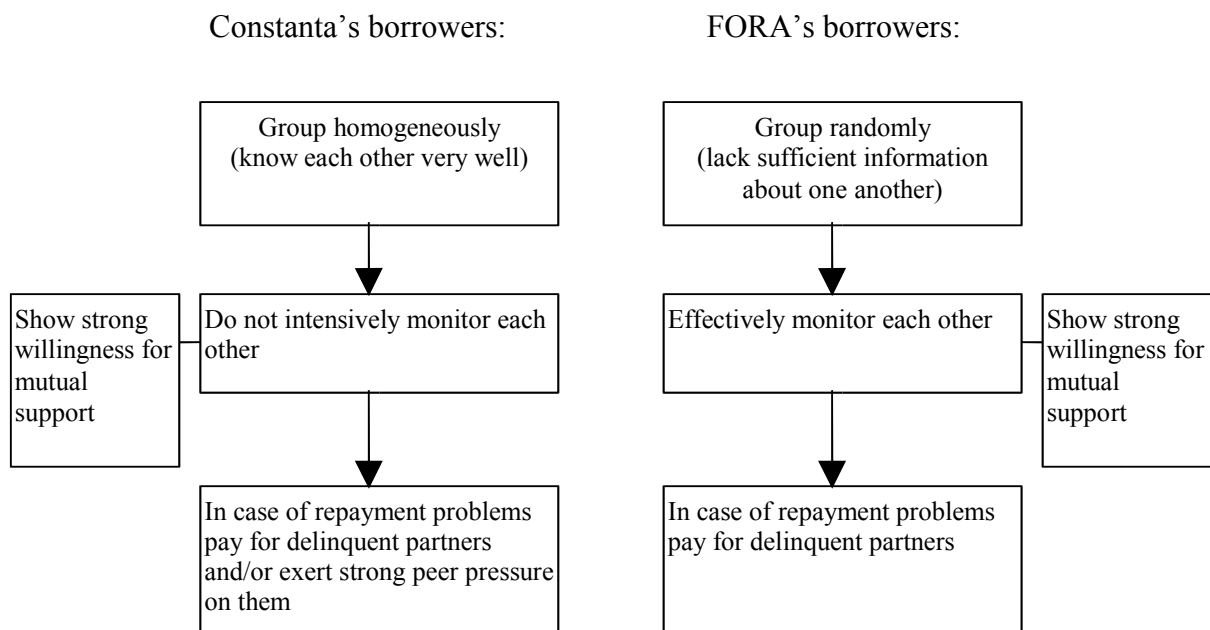
<sup>24</sup> This volatility does not arise from the higher riskiness of the projects - as the level of productivity of the women entrepreneurs does not significantly differ from that of the men - but is most probably a result from the fact that women divert bigger portion of their financial means to the household. Surveys carried out in the region reveal that women exhibit higher responsibility towards the family, spending most of their income for improvement of children's health and education.



The discussion starts with an analysis of how the quality and the amount of initial information determines the intensity of peer activities and how these activities affect the repayment performance of both individual borrowers and groups.

Figure IV.1 shows the group dynamics in the studied MFIs. The quality of self-selection process determines the intensity of all peer measures but peer support. It seems that the willingness for mutual help is an absolutely necessary condition for the success of the group lending MFIs no matter what the environmental settings and the program design are.

**Figure IV.2. Group Dynamics**



*Peer Support*

Peer support is the incentive mechanism that mostly contributes to the alleviation of the moral hazard problem in both studied MFIs. What makes borrowers promptly fulfill their repayment obligations is the belief that the group will help them in case of insufficiency. The biggest difference between the MFIs is that in Constanta the feeling of group solidarity grows stronger in the course of time, whereas in FORA it starts diminishing after the first three loan cycles. A probable reason for the growing mistrust among FORA's clients could be the fact that even though the most group members stay in close relationships, they typically lack prior experience in financial matters with one another. Only about 5 percent of the interviewed borrowers describe their peers as business associates before group formation, while 44 percent define them just as cosigners and over 51 percent as friends. As the loan officers report, many borrowers falsely believe that people who proved to be good friends will be good business partners as well. When the expectations do not justify, disappointment and mistrust destroy

the work of the group. To compare, in Constanta 49 percent of the groups are formed by business associates, around 21 percent by distant relatives, and 30 percent by friends.

The algorithm of calculating the interest rate used by FORA gives us another plausible explanation for the diminishing solidarity in its groups (see Table II.8). Along with the joint-liability contract FORA offers to its clients the possibility to take individual loans but charges for them higher interest rate. With every loan cycle, the interest rates on both contracts decrease at a different pace, so that after the third loan the difference between them disappears. At this stage, the costs for taking a group loan are the same as the costs for taking an individual credit. The joint-liability loan contract loses one of its main advantages. This undermines the motivation of the borrowers to stay in good terms with their peers.

Whatever is the reason for the weakening willingness for mutual support, the option given to the clients to switch to an individual lending contract after few loan cycles helps FORA to avoid serious repayment difficulties caused by mismatching problems within its mature groups.

#### ■ *Peer Monitoring*

FORA's borrowers compensate for the lack of sufficient initial intra-group information by carefully monitoring their peers during the entire lending period. They not only regularly meet their peers but also control their business outcome. Together with peer support, peer monitoring is the only measure taken by the clients to prevent internal delinquency.

In Constanta, the efficiency of peer monitoring is considerably lower. The high frequency of meetings<sup>25</sup> does not necessarily lead to a high level of mutual control. Constanta's borrowers meet their peers nearly every day but seldom speak about business. Borrowers are not much concerned about the business activities of the other group members as long as there are no signals of repayment failures. They start acting only after a problem has occurred by carefully auditing the business project of the defaulting partner. Thus, controlling, being used mainly as a corrective measure, helps Constanta solve the enforcement problem.

In this context it should be mentioned that a common problem for Constanta is the sudden emergence of severe coordination problems in groups that have built a perfect credit history and have always been considered as extremely reliable. Moreover, such problems arise even when the delinquency has been caused by external uncontrollable factors. This shows that under insufficient information when a repayment problem occurs the initial loyalty can quickly (usually within 2 – 3 weeks) transform into mistrust, leading to strong peer pressure.

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<sup>25</sup> 85.6% of the surveyed borrowers meet their peers every day, 2.1% meet them three or four times a week, 7.2% meet once or twice a week, and only 5.2% meet less than once a week.

This finding supports the theory of Wydick [2000] who states that borrowers often use social sanctions to compensate for poor informational flows.

- *Peer Pressure*

As mentioned above, in Constanta peer pressure proved to be a highly efficient means to enforce repayments. Similar to controlling, peer pressure is used by the borrowers only as a corrective measure. It does not prevent the occurrence of individual repayment failures.

Worth noting is the fact that in Constanta the willingness of the group to pay for a delinquent member (question 25, App. B) is highly correlated with the willingness to exert pressure on him (question 24, App. B), while in FORA, the two variables are statistically independent. I assume that the motivation of Constanta's clients to pay for their partners is not simply the willingness to support them but rather the willingness to promptly fulfill the repayment obligations. They are determined to use all possible means to insure the on-time repayment. Differently, most FORA's borrowers refrain from sanctioning a delinquent partner once they have decided to pay for him.

- *Social Ties*

In the theoretical literature, it is assumed that repayment failures are less likely to occur in socially homogeneous groups since defaulters suffer substantive utility losses due to the loss of reputation, on the one hand, and the stronger negative impact of the imposed social sanctions, on the other hand. The empirical results, however, fully contradict this presumption. The degree of social homogeneity within the groups proved to have no (Constanta) or rather a negative (FORA) effect on the group behavior. In FORA, the members of the highly cohesive groups are more likely to ride free. The possible loss of reputation among the current partners is obviously not a strong incentive to prevent the borrowers from strategic default most probably because of the fact that FORA operates only in urban, densely populated arrears, where the exclusion from a certain community does not lead to a complete social isolation. Furthermore, the free-riding behavior is additionally encouraged by the fact that most FORA's groups are reluctant to impose social sanctions on their defaulting members.

- *Dynamic Incentives*

A common finding for both studied MFIs is the fact that dynamic incentives, which were emphasized in many theoretical papers as being of crucial importance, proved to have no direct impact on borrowers' repayment performance. It can be assumed that most groups are formed by making relatively low-risk investments with low development prospects. These groups only need access to further loans (and feel sanctioned from the threat of exclusion) but

do not strongly respond to dynamic incentives. Due to their relatively static but safe investments the peers are less likely to run into mismatching problems in the course of time and some of them (Constanta's groups) even develop group solidarity feelings showing willingness for peer support.

This finding justifies the practice of the group-lending MFIs to impose restrictions on the size of the group loans. Through such kind of restrictions, the organization makes sure that the loans with joint liability will be attractive only to investments with relatively low risks. Borrowers with more dynamic investments who start their activity by making use of group loans (e.g. due to a lack of collateral) will then try to switch to the individual lending program when they have sufficient collateral, thus substantially decreasing the probability that a mismatching problem may occur.

#### ■ *Staff Pressure*

Despite of some differences in the way the group-lending mechanism functions, it has proven to be successful in inducing on-time repayments in both MFIs. One of the main reasons for its success is the MFIs' rigorousness and consistency in applying the major principles of joint liability – i) not intervention in the process of group formation; ii) each group member bears full responsibility for the repayment of the group loan; iii) members expelled from their groups are immediately excluded from the lending program; iv) all members of a defaulting group are disqualified from receiving future loans.

The role of the loan officers is crucial since their activities proved to have a strong complementary effect to the efficacy of the lending mechanism. During the screening process, loan officers require from the applicants to freely self-select in credit groups and never undertake any supportive activities with respect to the group building. Loan officers, however, carefully screen the newly formed groups by imposing some restrictions, such as i) denying loans to groups consisting predominantly of entrepreneurs whose income is too low to cover missing installments of delinquent peers, ii) denying loans to groups with more than one high-risk member (entrepreneurs with bad reputation or people without permanent residence in the region of borrowing), iii) decreasing the loan size for applicants who have low weekly turnovers, etc.

After the loan disbursement, no official meetings with borrowers are scheduled but, nevertheless, the loan officers try to stay in contact with their clients by paying them random and, as a rule, unexpected visits. If arrears occur, loan officers are permanently present at the group and exert high pressure on all members until the complete installment is collected. In the history of both MFIs there were only few cases of groups refusing to pay for a delinquent

peer. These groups were immediately excluded from the access to further loans and some of them even sued.

The decision to pursue a defaulting group usually does not make any economic sense, as the recovery expense is higher than the outstanding balance. It, however, proved to have a very strong psychological effect on the rest of the current clients. Since most of the borrowers have their working places very close to each other the information about the lender's response to delinquency, whether strict or lenient, spread rapidly. Delinquency, if not pursued, is highly contagious, causing an abrupt decline in the lenders' repayment rate. Vice versa, as the experience of FORA and Constanta shows, all defaulting groups fulfill their repayment obligations immediately after the execution of the first sentence.

## 2. Individual Micro-Lending

The analysis presented here follows with some small exceptions the structure of the study on the group-lending technology. Hypotheses 3 and 4 are tested by using data obtained through questionnaires given to 133 borrowers of the Batumi Branch of the Microfinance Bank of Georgia (MBG). The bank is a profit oriented financial institution which main mission is to support micro and small entrepreneurs by granting them micro and small loans specifically tailored to their needs. MBG applies a new non-conventional lending procedure that combines components from both the traditional - document-based - credit technology (the collateral) and the group-lending technology (e.g. prospective lending, regular repayment schedule, etc.). The loan size offered by the bank ranges from USD 200 to USD 25 000. As I was interested in the micro-lending activities of the bank, only borrowers with loans up to USD 2 500 were interviewed.

### 2.1 Testing the efficiency of the screening procedure

The lending process starts with identification of the borrower's risk type. Thereby the loan officers provide a thorough credit analysis of each applicant. Thus, by involving in a direct and costly screening procedure the bank aims to partly eliminate the adverse selection problem. Hypothesis 3 is tested. It will not be rejected if the  $\beta$ -coefficient of the *screening costs* variable proves to be significantly different from zero. Table IV.13 provides detailed descriptions of all variables used in the model.

The dependent variable *borrower's risk type* ( $Y_1$ ) measures the default probability of the surveyed borrowers. The borrowers were classified into three groups according to the risk profile of their business projects<sup>26</sup>: The clients ordered into group 1 were assessed as "higher risk", the clients from group 2 as "intermediate risk", and those from group 3 as "low risk". In contrast to all other questions in the survey instrument, this classification was done by the *loan officers* of the MBG Batumi. Their evaluation is based on the initial screening process and in particular on the permanent updating process which is done by the loan officers by considering the borrowers' repayment behavior, their most recent cash-flow analysis, their entrepreneurial characteristics and any other information which could have changed the risk profile of each borrower.

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<sup>26</sup> The loan officers were asked to evaluate on an ascending scale the business projects of their clients (from 1 – "very problematic" to 5 – "very stable and promising"). None of the businesses but one was assessed as "very problematic" or "somewhat problematic".

The first independent variable, *SE*, reflects the loan officers' screening efforts. It is measured by the number of meetings between the borrowers and the loan officers that took place prior to the loan disbursement. Besides the *screening efforts*, the right-hand side contains the variables *written records (WR)*, *education (E)*, and the *industry sector (IS)*. *E* is a dichotomous variable taking a value of 1 if the respondent has a university degree and 0 otherwise. *WR* (a dichotomous variable) shows whether the entrepreneur has any accounting skills or not. The last variable, *IS* (a value of 0 for trade & services, 1 for production), allows to test whether the borrowers involved in manufacturing activities are more successful than traders.

The results from the tests of parameter significance are listed in Table IV.14. The empirical analysis reveals that *screening efforts* is significant with a positive coefficient.

**Result 18:** The screening technology employed by MBG proved to be effective as its more intensive implementation significantly increases the probability that the selected borrowers will be of a better investment risk.

Result 1 supports the assertion that a micro-lender cannot become successful as long as he bases the decision to borrow capital to a micro-entrepreneur on his willingness to pledge collateral (even if it theoretically covers the full loan amount). Only an additional costly assessment of the risk characteristics enables the MFI to keep the later monitoring and enforcement cost at a low level. Since the MFI prefers to select borrowers who will punctually repay their installments instead of having to seize their collateral after a break down of their firm, the screening costs seem to be a "good investment".

All other variables that are available at little effort proved to be insignificant. It seems that the better education and the higher accounting skills do not give any advantages to the local micro-entrepreneurs.

## 2.2 Testing the efficiency of various incentive mechanisms

To mitigate the moral hazard and enforcement problems MBG relies mainly on the borrowers' willingness to both preserve the collateral and establish a long-term relationship with the bank. In this sub-section, I show the dynamics of the micro-lending technology of MBG. The results from the applied tobit model are presented in Table IV.15. The empirical findings support hypothesis 4. The borrowers' repayment behavior is significantly influenced by several factors: *collateral*, *dynamic incentives*, *borrower's risk type*, and *income diversification*.

The variable *collateral* illustrates on an ascending scale from 1 to 5 how much time and efforts it would take the borrower to restore the collateral in case the bank seized it. Its

significance underlines the importance of the collateral requirement as central method to differentiate between high and low risk borrowers and to mitigate moral hazard behavior among the chosen borrowers.

The second variable that positively influences the repayment rate is *dynamic incentives*. It indicates to what extent the client values the opportunity to receive larger subsequent loans. It is computed as a difference between the borrower's actual credit needs and the value of the loan received, expressed as a percentage of the loan amount:  $\frac{CreditNeeds - LoanSize}{LoanSize}$ . The higher the ratio, the higher the needs of additional financial means and hence the stronger is the borrower's motivation to apply for a larger loan.

*Income diversification* (a scale from 1 to 5 indicating to what extent the alternative income sources in the borrower's household exceed the income from the risky project) is the last significant variable. Alternative income sources in the household can be considered as a kind of insurance against delinquency in case of a business failure.

With respect to the variable *competition* (with a value of 1 if the client reported to know other financial institutions in the region he could borrow money from, 0 otherwise), I expected to find evidence of a negative correlation with the *repayment performance*. However, the coefficient is insignificant and very close to zero, showing that MBG does not have direct competitors in the region whose activities could jeopardize its financial soundness. The insignificance of *borrower's credit history* (with a value of 1 if the client reported to have borrowed money for business purposes prior to joining the lending program of the MBG Batumi, 0 otherwise) shows that the earlier borrowing experience does not give any additional information to the bank about the clients' repayment behavior, since it bases its decision about loan offers on the assessment of its own loan-officers.

**Result 19:** To mitigate the moral hazard and enforcement problems MBG relies mainly on (1) the efficiency of the loan officers' work before the loan is disbursed and (2) the borrowers' willingness to both preserve the collateral and establish long-term relationships with the bank, which offers them access to subsequently higher loans.

These findings stress the necessity of having a complementary screening procedure in addition to the self-selection processes created by the demand for collateral. Finally, it is remarkable that before and after the loan disbursement positive incentives (assessment as a "good risk", access to higher loans) as well as negative sanctions (strong restrictions on the initial loan size, pledging collateral that can be seized) are part of the incentive system.



### **3. Individual versus Group Lending**

Next, the group vs. individual lending debate is addressed. The comparison analysis is performed based on the surveys carried out in the two Georgian MFIs, the Microfinance Bank of Georgia (MBG), which employs an individual lending scheme, and the Foundation Constanta, which uses a group lending scheme. Both microfinance institutions have branches in Batumi, Georgia, operating in an identical cultural and economic environment and have partially overlapping target groups. Their different lending technologies are the only factor responsible for the observed differences in (1) the outreach and (2) the efficiency of the employed incentive mechanisms. This allows providing a direct comparison between both programs and answering the key research questions.

The survey was carried out in Batumi in the winter period 2001/2002. Both questionnaires, for Constanta and MBG clients, were designed in a similar way. Questions addressing program features relevant for both organizations (e.g. progressive lending, regular repayment schemes, etc.) are identical.

#### **3.1 Factors determining the choice of a lending contract**

The aim of the hypotheses testing performed in this section is to find the factors that determine the choice of a lending contract and subsequently to measure the degree of satisfaction with the loan terms and conditions offered by the MFIs.

The analysis starts with discussing the proposition that borrowers prefer individual to group-lending contracts. Micro-entrepreneurs may become borrowers at a group-lending program only if they do not have access to individual loans either because they do not possess any collateral to pledge or because there is no MFI in their neighborhood offering individual contracts.

The empirical results do not fully support this hypothesis. If the wealth status (and thus the availability of collateral) were the only factor that determines the choice of a lending contract all borrowers of Constanta should lack sufficient assets to pledge as collateral. However, I found that 11% of them were able to secure their loans at the time they signed the joint-liability contract. Apparently, there must be other reasons inducing some micro-entrepreneurs to deliberately choose a group-lending contract.

In the previous subsections, it was shown that dynamic incentives had no significant influence on the repayment behavior of the borrowers of Constanta, but did matter at MBG. This leads to the assumption that the size of the investment (whether the borrower's business grows or not) determines the choice of the loan contract and not vice versa as suggested by the theory.

Hypothesis 5 is tested by employing equation 6. The descriptive statistics on the key variables and the parameter estimates are presented in Tables IV.16 and IV.17. The dependent variable  $Y_6$  is determined by the choice of the contract. The RHS of the equation contains the variables *business development (BD)*, *interest rate (IR)* and *education (E)*. *BD* measures on an ascending scale from 1 to 5 how well the business project has developed since the borrower received his first loan. *IR* measures the sensitivity of credit demand to interest rate. It is a dummy variable taking a value of 1 if the entrepreneur said he would have taken a loan at interest rate of 5 – 8% per month.<sup>27</sup> *E* stands for higher knowledge (see Section IV.2.1).

The empirical results speak in favor of the inference that the two MFIs attract different types of borrowers. The variable *business development* is significant, supporting the suggestion that there is a self-selection process in the choice of the lending contract, which depends on the expected size of the future investments.

*IR* is the second significant variable. Its negative coefficient shows that the demand for group loans is less sensitive to interest rate than the demand for individual loans. This finding supports the assumption that borrowers who sign joint-liability contracts care more about access to capital than about price. *Education* is statistically insignificant.

**Result 20:** (1) Besides the wealth status, the other main factor determining the choice of the lending contract is the dynamics of the business project. Borrowers with dynamic business projects prefer individual loans; borrowers with static business projects rather prefer group loans. (2) Businesses with a dynamic perspective who have higher financial needs are more sensitive to the cost of borrowing than static businesses.

Last, I test hypothesis 6. The aim is to find out to what extent borrowers themselves were satisfied with the products offered by the two MFIs. For that, I analyze to what extent the borrowers' needs were met by the products offered by the two MFIs and then compare the respective results. All surveyed borrowers were asked to evaluate on an ascending scale from 1 to 5 (1) how well the repayment schedule fitted their cash flows, and (2) how well the received loan covered their financial needs. The two scales are used to measure the degree of borrower's satisfaction. The hypothesis is tested by applying a *two independent-samples t-test for equality of means*. The null hypothesis states that there is no significant difference in the distributions of both populations.

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<sup>27</sup> At the time of our investigation, Constanta charged an interest rate of 4%, MBG 3%, local users of 10%.

As can be seen in Table IV.18, the mean values of both scales are higher in the sample consisting of borrowers who signed individual lending contracts. The null hypothesis is rejected at 99% confidence level. Hence, the difference between the mean values in both samples is statistically significant, showing that the clients of MBG are indeed more satisfied with the loan terms and conditions. This finding, however, does not imply that the loan terms and conditions offered by Constanta are in general not suitable for its clients. In order to avoid possible misunderstandings I should point out that the difference comes from the fact that in Constanta both the loan size and the repayment schedule were reported to fit the needs of the borrowers well or very well (taking values of 3 or 4) while in MBG they fitted very well or extremely well (taking values of 4 or 5).

Further I compare the level of satisfaction between the clients of MBG and those of Constanta's borrowers who claimed to possess sufficient assets to pledge as collateral and hence could relatively easily switch to the individual lending program. According to the t-test results, the difference is insignificant (see Table IV.19). The fact that Constanta offers smaller loans with shorter maturity terms does not induce that its loan characteristics fit worse the business needs of this particular group of borrowers. The most probable explanation of this finding is that along the economically active poor people who lack collateral the group-lending scheme attracts also relatively wealthier entrepreneurs whose investment plans are less dynamic. Because of the limited capacity of their businesses, they would not be able to fully utilize larger loans even if they had the chance to obtain such. Furthermore, most of them, being traders, use the main part of the loans to purchase trading goods, which they resale within a relatively short time period and thus gather quickly the financial means necessary to repay the weekly installments on time.

**Result 21:** The individual lending contract is better designed to meet the needs of the micro-entrepreneurs. The difference between the two designs diminishes, when the borrowers of MBG are compared with those borrowers of Constanta who are able to pledge collateral.

### 3.2 Discussion

The fact that MBG Batumi and Constanta operate in the same market does not make them direct competitors<sup>28</sup>. The two MFIs employ different lending technologies and therefore attract different pools of borrowers. The main characteristics distinguishing the clients of Constanta from those of MBG are their lower level of income and the fact that they do not respond to dynamic incentives. With respect to the size and the dynamics of the business projects there

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<sup>28</sup> This assertion is supported by the fact that since August 2001 Constanta's clients repay their weekly installments at the cashier desks of MBG.

are four major types of micro-entrepreneurs: (1) poor (unable to secure collateral) with static investment; (2) poor with dynamic investments; (3) wealthier (able to pledge collateral) with static investments; and (4) wealthier with dynamic investments. Borrowers who belong to the first three groups sign as a rule joint-liability loan contracts. Borrowers who lack collateral do not have other options since they cannot qualify for an individual loan. Borrowers who do not plan to extend their businesses feel comfortable with the standardized lending procedure and in addition derive positive utility from the group process, e.g. having support from the group. Somewhat problematic is the situation only of the dynamic borrowers without collateral since their business development could be hampered by the restrictions inherent to the group-lending contract. The best solution for them is to switch to individual lending after having successfully gone through several loan periods with their groups. This might become possible in particular if these borrowers were able to develop some assets during their lending process in the joint-liability approach. In fact, loan officers at MBG target borrowers of Constanta if they gathered some form of collateral over time and have a dynamic business which demands loan volumes not provided anymore by Constanta.

Last, wealthier clients with a dynamic development perspective and a demand for relatively high or increasing loan volumes directly contact the loan officers of the MBG.

## V Conclusion

The aim of the proposed dissertation is to study the complete dynamics of the newly developed group and individual micro-lending technologies. The focus in the analysis is put on the question of to what extent borrowers behave as predicted by theory. The data used for the investigation were obtained through questionnaires given to 370 borrowers of three MFIs from Russia and Georgia. For the sake of the empirical analysis a multi-stage econometric model is built so that it allows to examine the borrowers' behavior at each stage of the lending period: before and after the loan disbursement.

Starting with the self-selection process in the group-lending MFIs, the analysis shows that, as predicted, homogeneous matching between borrowers brings informational advantages and helps the lender mitigate the adverse selection problem. It, however, does not always take place and seems to be not an absolutely necessary condition for the success of the group lending. In Constanta - where the group members are obliged to go through five training sessions before signing the contract - the better-risk borrowers team with better risk borrowers (and vice versa) by making use of local information, which is either costly or impossible for the lender to obtain. Different is the situation in the Russian group-lending institution, FORA, where the selection procedure has been considerably simplified and shortened. The loan officers do not require from the applicants to intensively communicate with their future peers, resulting in a building of heterogeneous groups with respect to the investment risk. This fact, however, does not jeopardize the financial stability of the MFI since FORA's borrowers seem to perceive the group as a kind of insurance mechanism and subsidize each other if necessary.

In Constanta where the borrowers group homogeneously, the empirical results unambiguously support also the second hypothesis of assortative matching: because of the borrowers' self-selection and the loan officers' screening efforts, the applicants with bad risk characteristics are left out of the credit market.

After the contract conclusion, there exist sufficient individual incentives for each group member to repay his loan as long as the development of his business enables him to do so. The informal (in the case of Constanta) and formal (in the case of FORA) monitoring efforts support these incentives. Strategic defaults seem to be not a serious problem in both group-lending MFIs.

Whenever external shocks cause repayment problems, the incentive system induces mutual activities. The intensity and the efficiency of these activities are to a high extent determined by the quality and the amount of initial intra-group information. In both MFIs the willingness for

mutual help turned out to mostly contribute to the alleviation of the moral hazard problem. However, in Constanta peer support grows stronger over time, whereas in FORA it starts diminishing after the third loan cycle. In groups built after a careful self-selection process and an intensive exchange of information (Constanta), the likelihood that a mismatching problem will occur is much smaller, giving evidence that in this case the group-lending mechanism is able to generate repayments over a long period. The negative point is that the group members rely too much on their screening efforts and do not monitor each others' business projects as long as there are no signals of repayment failures. When a problem occurs they intensify the peer activities by auditing the defaulter's work and imposing (or threatening to impose) social sanctions.

Different is the group dynamics in FORA. Its clients lack sufficient initial information and compensate it by carefully monitoring the peers during the entire lending period. If necessary, the group members insure each others' payments. In this case, peer pressure proved to be quite an inefficient tool to enforce repayments from a delinquent partner.

Further, the study shows that in both group-lending institutions the strong social ties between the group members do not positively affect their repayment performance. Moreover, in FORA the probability of default in highly cohesive groups turned out to be significantly higher. Apparently, in such groups borrowers stronger rely on the peers' unconditional support and are thus more likely to ride free.

Dynamic incentives – the other variable that was emphasized in many theoretical papers as being of crucial importance for the success of the group-lending mechanism – also proved to have no significant impact on borrowers' decisions. Access to higher loans is not part of the reason to pay back a previous loan. The empirical data gathered in FORA and Constanta reveals that only a minority of borrowers increased their loan size to the extent to which it is allowed by the MFIs, thus indicating that most clients have static businesses and make relatively low-risk investments with low development prospects. This explains why most of the groups that were investigated rarely run into mismatching problems but instead show relatively strong willingness for mutual help. In support to this finding, earlier empirical research (see e.g. Paxton [1996]) evidences that joint-liability approaches face in the long run mismatching problems when groups are formed by entrepreneurs whose businesses develop in a dynamic way. In groups where some businesses are generating very high profits and others not, the willingness for being jointly responsible for the repayment of the loans dramatically decreases. This leads to the conclusion that it is advisable to restrict the component 'dynamic incentives' in group-lending methodologies.

To complete the analysis of group lending the role of the loan officers in the screening and the enforcement processes should be underlined. Their activities proved to have a strong

complementary effect on the efficacy of the lending mechanism. The efficiency of the incentive system could be secured only if the MFIs consistently and rigorously apply the principle of joint liability.

The second part of the dissertation analyzes the key factors of the individual micro-lending contracts and compares these with the key factors of the joint-liability contracts. The study is based on the experience of the Batumi Branch of the Microfinance Bank of Georgia. Starting with the period before signing the contract the analysis illustrates the high efficiency of the screening procedure. The screening efforts of the MBG's loan officers are positively correlated with the quality of the borrowers' business projects. The MFI strongly relies on the loan officers' work to ensure that the borrowers' investment projects are viable and that the clients are willing to repay their loans. In addition to evaluating the borrower's business projects, the loan officers assess the financial situation of the complete household. By choosing entrepreneurs with steady and diversified household's income streams, they make sure that the clients would be able to cover their installments even if their main business fails.

After the contract conclusion, the main factor driving the high repayment rate is the borrowers' strong willingness to both preserve the assets pledge as collateral and receive further and higher loans. MBG was able to realize a 100% repayment rate on its loans by exploiting these clients' characteristics. In case of delinquency, the borrowers are threatened with both exclusion from the lending program and selling the collateral. In case of a prompt repayment, the borrowers automatically get access to larger subsequent loans.

Next, the dissertation compares the incentive systems and the lending practices of the two MFIs operating in the city of Batumi: the MBG and Constanta. In particular, it examines the factors that determine the choice of a lending contract. Earlier theoretical and empirical investigations suggest that the selection of optimal contract depends only on borrowers' wealth (Madajewicz [1999]). Thus, the a priori expectation was that the wealthier among the poor (those who were able to pledge collateral) would prefer individual to group contracts. The experience of the MFIs in Batumi, however, does not fully support this assertion. I found out that a considerable part of Constanta's borrowers (11%) were wealthy enough to secure their loans with collateral and nevertheless have deliberately chosen the joint-liability contract. A direct comparison between them and the clients of MBG reveals significant differences in the way their business projects develop. The former run businesses with static investments, whereas the latter run businesses with dynamic development perspectives. This finding explains why the variable dynamic incentives proved to have no impact on the repayment behavior of Constanta's borrowers, but did matter at MBG. The dynamics of the borrowers' business projects was found to be the second main factor determining the choice of the lending contract.

The empirical results lead to the conclusion that different lending technologies attract different types of businesses. Micro-entrepreneurs with growing businesses prefer the loans of MBG, whereas micro-entrepreneurs with static businesses choose the services of Constanta. The latter usually demonstrate strong willingness to provide peer support within the group. The joint-liability approach creates additional utility for them as it works like an implicit insurance against temporary repayment problems. A borrower would fail with a higher probability if he had to manage all his problems independently, without the support of the group.

Based on the analysis presented in this dissertation I cannot give an unambiguous answer to the question whether there is a superior design of micro-lending contracts. If the whole spectrum of low-income entrepreneurs is to be served a combination of individual and group loans should be offered. In the city of Batumi, the MBG with its flexible organizational structure, personalized lending contracts, and an average loan size (of the surveyed clients) of USD 960 successfully serves the wealthier micro-entrepreneurs mainly by financing the expansion of their businesses. In this way, the bank significantly contributes to the improvement of the business environment in the region. Through its financial activities, it fosters economic efficiency and even economic growth. However, MBG does hardly affect the vast majority of very poor economically active people who lack collateral. It also does not meet the needs of the entrepreneurs who have sufficient assets but run static businesses. These two groups are targeted by Constanta, which provides highly standardized loans with an average size of USD 220. Its lending procedure is not suitable for fast developing projects but secures continuous inflow of a small amount of financial means, thus enabling borrowers to maintain their tiny businesses.



## References

- Aldrich, J.; Nelson, F.:** *Linear Probability, Logit, and Probit Models*, Sage Publications (1984)
- Armendariz de Aghion, Beatriz:** On the Design of a Credit Agreement with PeerMonitoring, *Journal of Development Economics*, Vol.60, No.1, pp.79-104 (1999)
- Armendariz de Aghion, B.; Gollier, C.:** Peer Group Formation in An Adverse Selection Model, *The Economic Journal* 110, 632 – 642 (2000).
- Armendariz de Aghion, B.; Morduch, J.:** Microfinance Beyond Group Lending, *Economics of Transition* 8, 401-420 (2000).
- Backhaus; Erichson; Plinke:** *Weiber Multivariate Analysemethoden*, Berlin: Springer-Verlag (2000)
- Besley, Timothy; Stephen Coate:** Group Lending, Repayment Incentives, and Social Collateral, *Journal of Development Economics*, Vol.46, No.1, pp.1-18 (1995)
- Bolton, P.; Scharfstein, D.:** A Theory of Predation Based on Agency Problems in Financial Contracting, *American Economic Review* 80, 93-106 (1990).
- Churchill, C.:** *Client-Focused Lending: The Art of Individual Lending*. Toronto (1999).
- Coleman, Brett E.:** The impact of group lending in Northeast Thailand, *Journal of Development Economics*, Vol.60, No. 1 pp. 105-141 (1999)
- Conlin, Michael:** Peer group micro-lending programs in Canada and the United States, *Journal of Development Economics*, (60) 1 pp. 249-269 (1999)
- Conning, Jonathan:** Monitoring by Delegates or by Peers? Joint Liability Loans under Moral Hazard, Williams College (2000)
- Conning, Jonathan:** Outreach, Sustainability, and Leverage in Monitored and Peer-Monitored Lending, *Journal of Development Economics*, Vol.60, No.1, pp.51-77 (1999)
- Diagne, A.:** Default Incentives, Peer Pressure, and Equilibrium Outcomes in Group-Based Lending Programmes, International Food Policy Research Institute, Work. Paper (1998).
- Ghatak, Maitreesh:** Group lending, local information and peer selection, *Journal of Development Economics*, Vol.60, No.1, pp. 27-50 (1999)
- Ghatak, M.; Guinnane, T.:** The Economics of Lending with Joint Liability: Theory and Practice, *Journal of Development Economics* 60, 195-228 (1999).

- Gonzalez-Vega, Claudio, et al.:** Microfinance Market Niches and Client Profiles in Bolivia, *Economics and Sociology Paper No.2346*, Columbus, Ohio, The Ohio State University (1996)
- Hardy, D.; Holden, P., Prokopenko, V.:** Microfinance Institutions and Public Policy, *IMF Working Papers Nr. 159* (2002)
- Hardy, M.:** *Regression with Dummy Variables*, Sage Publications (1993)
- Hulme, David:** Impact Assessment Methodologies for Microfinance: Theory, Experience and Better Practice, *World Development*, Vol. 28, No.1, pp.79-98 (2000)
- Jain, Pankaj:** Managing Credit for the Rural Poor: Lessons from the Grameen Bank, *World Development*, Vol. 24, No.1, pp.79-89 (1996)
- Jaccard, J.:** *Interaction Effects in Logistic Regressions*, Sage Publications (2001)
- Kleinbaum, D.; Klein, M.:** *Logistic Regression*, New York: Harvester Wheatsheaf (1994)
- Knoke, D.; Burke, P.:** *Log-Linear Models*, Sage Publications (1980)
- Kreps, David:** *A Course in Microeconomic Theory*, New York: Springer (2002)
- Kritikos, A.S.:** Micro-credits with incentive-guided solidarity action, *Kredit und Kapital* 32, 393-425 (1999).
- Lazear, E.P.:** Entrepreneurship, IZA Disc. Paper No. 760 (2003).
- Madajewicz, Margaret:** Capital for the Poor: The Effect of Wealth on the Optimal Credit Contact, Columbia University (1999)
- Menard, S.:** *Applied Logistic Regression Analysis*, Sage Publications (1995)
- Micro Credit Summit:** Council of Practitioners, Institutional Profile, Washington (2002).
- Microfinance Bank of Georgia.** 2000. Annual Report
- Montgomery, Richard:** Disciplining or protecting the poor? Avoiding the social costs of peer pressure in micro-credit schemes, *Journal of International Development*, Vol.8.No.2, 289-305 (1996)
- Morduch, Jonathan:** Does Microfinance Really Help the Poor? New Evidence from Flagship Programs in Bangladesh, *Harvard University* (1998)
- Morduch, Jonathan:** The Microfinance Promise, *Journal of Economic Literature*, Vol.37, pp. 1568-1614 (1999)
- Morduch, Jonathan:** The role of subsidies in microfinance: evidence from the Grameen Bank, *Journal of Development Economics*, Vol.60, No.1, pp. 229-248 (1999)

- Nagarajan, G.:** Fundusz Micro, Poland. *Micro Banking Bulletin* 4, 1-7(2000).
- Navajas, Sergio:** Credit for the Poor: Microlending Technologies and Contract Design in Bolivia, PhD. Dissertation, The Ohio State University (1999)
- Navajas, Sergio; Claudio Gonzalez-Vega:** Innovative Approaches to Rural Lending: Financiera Calpia in El Salvador, typescript <http://www-agecon.ag.ohio-state.edu/RuralFinance/publications.htm> (1999)
- Navajas, Sergio; Jonathan Conning; Claudio Gonzalez-Vega:** Lending Technologies, Competition, and Consolidation in the Market for Microfinance in Bolivia, typescript <http://www-agecon.ag.ohio-state.edu/RuralFinance/publications.htm> (2000)
- Otero, M.; Rhyne, E. (eds.):** *The New World of Microenterprise Finance*, Kumarian Press (1994).
- Pampel, F.:** *Logistic Regression*, Sage Publications (2000)
- Paxton, Julia Anne:** Determinants of Successful Group Loan Repayment: An Application to Burkina Faso, PhD. Dissertation, The Ohio State University (1996)
- Pischke, J.D. von:** Finance at the Frontier: Debt Capacity and the Role of Credit in the Private Economy, Washington, The World Bank, EDI Development Studies (1991).
- Sadoulet, L.:** The Role of Mutual Insurance in Group Lending, ECARE, Work. Paper (1997).
- Sadoulet, L.; Carpenter, S.:** Risk-Matching in Credit Groups: Evidence from Guatemala. *ECARES, Free University of Brussels*, (1999).
- Sharma, M.; Zeller, M.:** Repayment Performance in Group-Based Credit Programs in Bangladesh: An Empirical Analysis. *World Development* 25 (10), (1997).
- Schreiner, Mark; Claudio Gonzalez-Vega; Margarita Beneke de Sanfeliu; Mauricio Shi:** Notes on Methods Used in a Survey of Rural Clients of Financiera Calpia in El Salvador, typescript <http://www-agecon.ag.ohio-state.edu/programs/ruralfinance/pdf/notes.pdf> (1998)
- Schmidt, Reinhard; Claus-Peter Zeitinger:** Critical Issues in Microbusiness Finance and the Role of Donors, Disc. Paper No. 6 (1997).
- Schmidt, Reinhard; Claus-Peter Zeitinger:** Prospects, problems and potential of credit-granting NGOs, *Journal of International Development*, Vol.8.No.2, 241-258 (1996)
- Stiglitz, Joseph:** Peer Monitoring in Credit Markets, *World Bank Economic Review*, No.4, pp.351-366 (1990)

- Stiglitz, Joseph:** The New Development Economics, *World Development*, No.14, pp.257-265 (1986)
- Stiglitz, Joseph; Andrew Weiss:** Credit Rationing in Markets with Imperfect Information, *The American Economic Review*, Vol.71, No.3, pp.393-410 (1981).
- Stiglitz, J.E.; Weiss, A.:** Incentive Effects of Terminations: Applications to the Credit and Labor Markets, *American Economic Review* 73, 912-927 (1983).
- Tacis Project SMERUS 9803 - Support to the Development of Small Entrepreneurship:** Improving of Access to Finance for Small Business in Russia, Moscow (2002)
- Thiele, Andreas:** Microfinance Bank of Georgia: Maintaining the Momentum of Growth, *IPC Working Paper* No. 23 (2000)
- Van Tassel, Eric:** Group Lending under Asymmetric Information, *Journal of Development Economics*, Vol.60, No.1, pp.3-25 (1999)
- Varian, Hal:** Monitoring Agents with Other Agents, *Journal of Institutional and Theoretical Economics*, Vol. 146, No.1, pp.153-174 (1990)
- Walker, Elizabeth:** Women and Microfinance in the New Russia: Making in Work, Oberlin College, Oberlin, OH (2002)
- Wasmus, Koen; Barbara Sajet:** MEB Kosova: The First Steps, *IPC Working Paper* (2000)
- Wenner, Mark:** Group Credit: A Means to Improve Information Transfer and Loan Repayment Performance, *Journal of Development Studies*, Vol. 32, No.2, pp. 263-281 (1995)
- White, H.:** Maximum Likelihood Estimation of Misspecified Models, *Econometrica* 50:1-25 (1982).
- Women for Urban Development:** Effect of Microfinance Service on Poor Entrepreneurs of Georgia (2001)
- Woolcock, M.J.V.:** Learning from Failures in Microfinance, *American Journal of Economics and Sociology* 58, 17-42 (1999).
- Wydick; Bruce:** Can Social Cohesion Be Harnessed to Repair Market Failures? Evidence from Group Lending in Guatemala, *Economic Journal*, Vol. 109, pp. 463-475 (1999)
- Zeller, M.:** Determinants of Credit Rationing: A Study of Informal Lenders and Formal Credit Groups in Madagascar, *FCND Discussion Paper* No.2 (1994).

**Zeller, M.:** Determinants of Repayment Performance in Credit Groups: The Role of Program Design, Intra-Group Risk Pooling, and Social Cohesion in Madagascar. *Economic Development and Cultural Change* 46 (3), 599-620 (1998).

## **Appendix A Tables**

**Table I.1: Previous Empirical Research**

<b>Incentive Mechanism</b>	<b>Zeller (1998)</b>	<b>Sharma and Zeller (1997)</b>	<b>Wydick (1999)</b>	<b>Wenner (1995)</b>	<b>Sadoulet and Carpenter (2001)</b>	<b>Lensink and Mehrteab (2002)</b>
<i>Survey carried out in:</i>	<i>Madagascar</i>	<i>Bangladesh</i>	<i>Guatemala</i>	<i>Costa Rica</i>	<i>Guatemala</i>	<i>Eritrea</i>
<i>Assortative Matching</i>	The way the group is formed does not influence repayment rates	Default rates are lower for groups that form on their own. No test for group homogeneity	-	Groups engaged in screening are less likely to be delinquent. No test for group homogeneity	Evidence of random matching	Evidence of random matching
<i>Peer Support</i>	-	-	-	-	-	-
<i>Peer Monitoring</i>	-	-	Evidence of intensive peer monitoring in urban areas	-	-	-
<i>Peer Pressure</i>	-	-	Evidence of strong peer pressure in rural areas where monitoring is difficult	-	-	-
<i>Dynamic Incentives</i>	-	-	-	-	-	-
<i>Social Cohesion</i>	Positive effect on repayment rates	Negative effect on repayment rates	No significant effect on borrowers' behavior	-	-	-
<i>Correlation across project returns</i>	-	Portfolio diversity within groups matters	-	-	-	-
<i>Loan Size</i>	-	Delinquency rate increases with loan size	-	-	-	-
<i>Group Size</i>	With larger group size repayment performance improves	No effect of borrowers' repayment performance	-	-	-	-

**Table II.1. Constanta: Lending methodology**

<i>Group size</i>	7 – 15 borrowers in a group
<i>Minimal credit size</i>	GEL 100 (US\$ 50)
<i>Credit duration (term)</i>	16 weeks
<i>Loan increase</i>	Max 50% increase of the previous loan amount
<i>Interest rate</i>	4%
<i>Repayment</i>	Weekly
<i>Fine for delay</i>	1% of delayed amount per day
<i>Guaranties</i>	Group guarantee

**Table II.2. Constanta: Loan officers' output**

	01/ 01	02/ 01	03/ 01	04/ 01	05/ 01	06/ 01	07/ 01	08/ 01	09/ 01	10/ 01	Average
Number of active borrowers per loan officer	408	428	474	518	307	309	318	347	346	346	380
Number of new borrowers per loan officer	20	43	65	55	19	26	36	28	20	18	33
Portfolio per loan officer (GEL)	38 095	50 420	72 209	76 016	33 877	42 973	54 347	57 697	54 289	66 090	54 601

**Table II.3. Constanta: Operational and financial self-sufficiency**

		01/01	02/01	03/01	04/01	05/01	06/01	07/01	08/01	09/01	10/01
Operational self-sufficiency (%)	Operational income / operating costs + loan losses provision	174,0	157,2	140,4	194,0	219,3	189,3	159,6	228,2	227,7	220,5
Financial self-sufficiency (%)	Financial income + Operational income / Operating costs + financial costs + loan losses provision + cost of capital + cost of funds + expected tax expenses	100,0	90,2	84,9	106,6	124,8	108,5	91,9	125,9	125,2	126,3



**Table II.4. Georgia: Financial sector**

	1997	1998	1999	2000	2001
Number of banks	53	43	37	30	27
Total assets of banks (million USD)	252.2	260.9	307.8	387.4	392.6
M3/GDP (%)	6.3	7.2	7.5	8.6	9.7
Dollarisation ratio	58%	63%	76%	72%	82%

**Table II.5. MBG: Impact on the financial sector of Georgia**

	1999	2000	2001
Share of Total Assets	1.8%	4.8%	6.9%
Share of Private Sector Credit	1.9%	6.1%	10.8%

**Table II.6. MBG Batumi: Credit terms**

	Individual credit
<i>Credit range</i>	From US\$ 200 to US\$ 25 000 (for credit amounts exceeding US\$ 25 000 a special approval from the Head Office is required)
<i>Credit duration (term)</i>	From 1 month to 5 years
<i>Interest rate</i>	Between 2% and 3%, calculated on the basis of the outstanding balance of the credit
<i>Repayment</i>	Monthly equal installments, principal + interest rate
<i>Collateral</i>	Any kind of movable or immovable property, which value should equal or exceed 150% of the credit amount

**Table II.7. FORA: Loan terms**

Category	Loan size (in roubles)	Loan term	Loan Security	Repayment scheme (interest and principal)	Purpose of financing	Requirements of credit analysis	Price (interest rate)
1	below 10.000	up to 4 months	1.Group(solidarity guarantee)	<ul style="list-style-type: none"> <li>even or uneven portions,</li> </ul>	working capital	financial plan (cash flow)	defined in regions in the range of 70%-36% on declining balance
2	10.001 - 50.000	up to 6 months	2.Personal guarantors (physical or legal entities)	<ul style="list-style-type: none"> <li>weekly, bi-monthly, monthly depending on client's cash flow,</li> </ul>	working capital + fixed assets		
3	50.001 - 80.000	up to 9 months			3.Collateral	<ul style="list-style-type: none"> <li>grace period (for principle payment) - up to 2 months,</li> </ul>	
4	80.001 - 100.000	up to 12 months					
5	over 100.000	up to 18 months	4.Combinations of the above	<ul style="list-style-type: none"> <li>for group loans: simultaneous disbursement and final payment, individual interim payment schedule</li> </ul>			

*Note: Individual are the loans that are secured by collateral or/and personal guarantors.*

**Table II.8.** Hub “Perspectiva”: Algorithm of calculating the interest rate

Loan Cycle:		I	II	III	IV	V
Group Loan:	<i>Group Size:</i>					
	3 members	54%	48%	42%	42%	42%
	4 members	48%	42%	42%	42%	42%
	5 members	42%	42%	42%	42%	42%
Individual Loan:	<i>Loan Purpose:</i>					
	Trading	60%	54%	48%	42%	42%
	Production	60%	54%	48%	42%	36%

**Table IV.1.** Demographic and Socio-economic Characteristics of the Credit Groups

<b>% of the groups all members of which have (the same):</b>	<b>FORA</b>	<b>Constanta</b>
<i>Gender</i>	49%	36%
<i>Age</i>	56%	11%
<i>Education</i>	26%	14%
<i>Occupation</i>	14%	37%
<i>Monthly Income Level</i>	43%	2%
<i>Mobility</i>	86%	80%
<i>Participation in joint social activities</i>	69%	90%
<i>Type of Relationship:</i>		
<i>relatives</i>	0%	21%
<i>friends</i>	51%	30%
<i>business partners</i>	5%	49%
<i>cosigners</i>	44%	0%
<i>Business Correlation:</i>		
<i>no correlation</i>	22%	12%
<i>(very) weak correlation</i>	34%	28%
<i>(very) strong correlation</i>	44%	60%
<i>Monitoring costs:</i>		
<i>no costs</i>	60%	10%
<i>moderate</i>	28%	59%
<i>high costs</i>	12%	31%

**Table IV.2.** Group-Lending MFIs: Description of the Key Variables

The questions (Appendix A) used for constructing the variables are in parentheses, column 1.

	Description	Constanta		FORA	
		Frequency <sup>a</sup> (%)	Mean (Standard Deviation)	Frequency <sup>a</sup> (%)	Mean (Standard Deviation)
<b>Dependent Variables:</b>					
<i>Group Quality</i> (question 18)	Scale (from 1 to 5) indicating how the borrower's evaluated the success probability of the business projects of his prospective peers prior to joining the group.		4.16 (.49)		3.87 (.65)
<i>External Repayment Performance</i> (questions 22)	Dummy Variable with a value of 1 if there was no incidence of external delinquency <sup>29</sup> (between the credit group and the lender), and 0 otherwise.	0 – 8 ( 8.2%) 1 – 89 (91.8%)		0 – 29 (26.6%) 1 – 80 (73.4%)	
<i>Internal Repayment Performance</i> (questions 23)	Dummy variable with a value of 1 if there was no incidence of internal delinquency (between the members and the credit group), and 0 otherwise.	0 – 22 (22.9%) 1 – 74 (77.1%)		0 – 31 (26.7%) 1 – 85 (73.3%)	
<b>Explanatory Variables:</b>					
<i>Borrower's Risk Type</i> (questions 43,44,45)	Cluster Analysis Score <sup>30</sup> : Cluster 1: Low risk borrowers Cluster 2: Low to middle risk borrowers Cluster 3: Middle risk borrowers	1 – 22 (24.2%) 2 – 40 (44.0%) 3 – 29 (31.8%)		1 – 36 (33.0%) 2 – 52 (47.7%) 3 – 21 (19.3%)	
<i>Information</i> (question 17)	Information about other group members' business projects obtained during the self-selection process: 1 (no information) to 5 (detailed information)		4.36 (.898)		3.39 (1.048)
<i>Credit Needs</i> (question 36)	Metric Variable indicating the actual credit needs of the interviewed borrower.		1563.68 (2113.55)		1592 (839)

<sup>a</sup> Due to missing answers the total number of borrowers varies from variable to variable.

<sup>29</sup> Delinquency is defined as the failure to meet repayment obligation at the date complete repayment is due.

<sup>30</sup> See Appendix B

<i>Education</i> (question 2)	Categorical Variable: 1 – school 2 – college 3 – university	1 – 3 (3.20%) 2 – 70 (73.7%) 3 – 22 (23.1%)	1 – 29 (71.6%) 2 – 86 (73.7%) 3 – 5 ( 4.7%)		
<i>Relationship</i> (question 13)	Categorical Variable: 1 - if there are <u>relatives</u> among group members 2 - if there are <u>close friends</u> among group members 3 - if the group members are <u>business partners</u> 4 - if the group members are just <u>co-signers</u>	1 – 21% 2 – 30% 3 – 49% 4 – 0%		1 – 0% 2 – 51% 3 – 5% 4 – 44%	
<i>Monitoring</i>	Constanta: (question 19) Scale (from 1 to 5) indicating the frequency of meetings between the peers. FORA: (question 19,20,21) FA Score <sup>31</sup> indicating (1) how often peers meet each other, (2) how often they discuss their business problems within the group, and (3) how well they know each other’s business outcome.		4.65 (.94)		-1.9E-16 (.893)
<i>Controlling</i> (question 20)	Constanta only: Scale (from 1 to 5) indicating how frequent peers discuss their business problems within the group.		2.30 (1.34)		
<i>Peer Pressure</i> (question 24,26,27)	FA Score indicating (1) how strong is the group pressure exerted on delinquent members, (2) what kind of consequences delinquent members face, and (3) what kind of consequences defaulting groups face.		-5.6E-17 (.830)		3.47E-17 (890)

<sup>31</sup> See Appendix B

<i>Peer Support</i>	Constanta: (question 46) Dummy Variable with a value of 1 if ceteris paribus the borrower prefers group lending to individual lending. FORA: (question 25) Scale (from 1 to 5) indicating the willingness of the group to pay for defaulting members.	0 – 26 (28.3%) 1 – 66 (71.7%)			3.72 (1.24)
<i>Dynamic Incentives</i> (question 30)	FA Score indicating how much the borrower values the chance to receive subsequent loans: (1) of a bigger size; (2) at a lower interest rate; (3) with longer terms to maturity; (4) at lower transaction costs.		.000 (.926)		1.73E-18 (.847)
<i>Staff Pressure</i> (question 28)	Scale (from 1 to 5) indicating how often the borrower meets his/her loan officer after the disbursement of the loan.		3.39 (1.39)		2.14 (1.09)
<i>Business Correlation</i> (question 15)	Scale (from 1 to 5) measuring the positive risk correlation across peers' project returns.		3.48 (1.2)		3.04 (1.19)
<i>Social Ties</i> <sup>32</sup> (question 14)	Scale measuring the homogeneity of the groups with respect to some demographic and social variables, such as gender, age, income, etc.		2.63 (1.18)		3.01 (1.57)
<i>Loan Duration</i> (question 6)	FORA only: Loan duration (in months).				4.97 (1.15)

<sup>32</sup> Question 14 contains 6 short “yes or no” questions. Each positive answer takes a value of 1. The sum over all questions gives the value of the index. For example, if there are only two “yes” responses “social ties”=2.

**Table IV.3. Constanta and FORA: Cluster Indicators**

	FORA			Constanta		
	Cluster 1	Cluster 2	Cluster 3	Cluster 1	Cluster 2	Cluster 3
Average monthly income (question 43)	5.00 (0.000)	3.93 (0.107)	1.94 (0.099)	4.64 (0.49)	2.71 (0.554)	1.5 (0.509)
Changes in the monthly income since the first loan disbursement (question 45)	4.39 (0.104)	4.05 (0.13)	4.15 (0.068)	4.08 (0.49)	4.45 (0.504)	3.97 (0.186)
Stability of the business project (question 44)	4.17 (0.081)	3.54 (0.079)	3.34 (0.076)	3.64 (0.7)	3.88 (0.593)	3.43 (0.504)

**Table IV.4. Constanta: Selection Process: Ordinal Logit Model**

<b>Constanta</b>	Number of obs	=	89			
	Wald chi2(11)	=	30.12			
	Prob > chi2	=	0.0015			
	Pseudo R2	=	0.2383			
Log pseudo-likelihood = -47.911402						
-----						
Group		Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
Quality						
-----						
<b>Borrower's</b>						
<b>Risk Type (1)</b>		<b>1.496718</b>	<b>.7530923</b>	<b>1.99</b>	<b>0.047</b>	<b>.0206844</b> <b>2.972752</b>
Borrower's						
Risk Type (2)		.8255592	.675619	1.22	0.222	-.4986296 2.149748
<b>Information</b>		<b>1.152493</b>	<b>.4166041</b>	<b>2.77</b>	<b>0.006</b>	<b>.335964</b> <b>1.969022</b>
Education (1)		-.836417	.8977226	-0.93	0.351	-2.595921 .9230869
Education (2)		-1.674339	.9055035	-1.85	0.064	-3.449093 .1004156
Credit Needs		.1502752	.2184312	0.69	0.491	-.2778421 .5783925
Relationship1		.2164262	.8725605	0.25	0.804	-1.493761 1.926613
Relationship2		-.6195898	.6391171	-0.97	0.332	-1.872236 .6330566
Controlling		-.3457358	.2541527	-1.36	0.174	-.8438661 .1523944
Monitoring		.4362738	.2964491	1.47	0.141	-.1447558 1.017303
Peer Pressure		.084894	.3809875	0.22	0.824	-.6618278 .8316158
-----						
Intercept 1		2.298177	2.039238			(Ancillary parameters)
Intercept 2		8.300868	2.226209			
-----						

The table presents the results of the ordered logit model used to test hypothesis 1 (equation (1)). The coefficients (column 2) are maximum likelihood estimates. The robust standard errors are calculated by using the White heteroscedastisity-consistent covariance matrix (column 3).



**Table IV.5. Constanta: Binary Logit Model of Internal Delinquency**

Constanta		Number of obs = 89				
Log pseudo-likelihood = -38.043283		Wald chi2(9) = 16.44	<b>Prob &gt; chi2 = 0.0583</b>			
		Pseudo R2 = 0.2177				
Internal Delinquency	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
<b>Peer Support</b>	<b>1.975335</b>	<b>.9417323</b>	<b>2.10</b>	<b>0.036</b>	<b>.1295741</b>	<b>3.821097</b>
Dynamic Incentives	-.2477902	.3166431	-0.78	0.434	-.8683993	.372819
Borrower's Risk Type (1)	-.4645522	.767912	-0.60	0.545	-1.969632	1.040528
Borrower's Risk Type (2)	.3788537	.6947694	0.55	0.586	-.9828694	1.740577
Peer Pressure	.2988541	.3576939	0.84	0.403	-.402213	.9999211
Monitoring	-.1432585	.243341	-0.59	0.556	-.6201981	.3336811
<b>Controlling</b>	<b>-.7309173</b>	<b>.2298618</b>	<b>-3.18</b>	<b>0.001</b>	<b>-1.181438</b>	<b>-.2803965</b>
Business Correlation	-.039557	.1932282	-0.20	0.838	-.4182772	.3391632
Social Ties	-.1596288	.2696362	-0.59	0.554	-.6881061	.3688484
Intercept	3.876719	1.567759	2.47	0.013	.8039682	6.949469

The table presents the results of a binary logit model of internal delinquency (equation (2)). The coefficients (column 2) are maximum likelihood estimates. The robust standard errors are calculated by using the White heteroscedastisity-consistent covariance matrix (column 3).

**Table IV.6. Constanta: Binary Logit Model of External Delinquency**

Constanta		Number of obs = 88				
Log pseudo-likelihood = -14.586504		Wald chi2(8) = 18.78	<b>Prob &gt; chi2 = 0.0161</b>			
		Pseudo R2 = 0.4559				
External Delinquency	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
<b>Peer Support</b>	<b>3.218903</b>	<b>1.685047</b>	<b>1.91</b>	<b>0.056</b>	<b>-.0837277</b>	<b>6.521533</b>
Dynamic Incentives	-.3458615	1.569129	-0.22	0.826	-3.421297	2.729574
<b>Group Quality</b>	<b>3.083676</b>	<b>1.428604</b>	<b>2.16</b>	<b>0.031</b>	<b>.2836643</b>	<b>5.883688</b>
<b>Peer Pressure</b>	<b>1.695591</b>	<b>.9871645</b>	<b>1.72</b>	<b>0.086</b>	<b>-.2392161</b>	<b>3.630398</b>
Monitoring	.1968169	.3097856	0.64	0.525	-.4103518	.8039856
<b>Controlling</b>	<b>-1.284641</b>	<b>.7788511</b>	<b>-1.65</b>	<b>0.099</b>	<b>-2.811161</b>	<b>.2418794</b>
Business Correlation	-.7807948	.4308281	-1.81	0.070	-1.625202	.0636127
Social Ties	-.4598422	.7077336	-0.65	0.516	-1.846975	.9272903
Intercept	-2.883681	6.442214	-0.45	0.654	-15.51019	9.742827

The table presents the results of a binary logit model of external delinquency (equation (3)). The coefficients (column 2) are maximum likelihood estimates. The robust standard errors are calculated by using the White heteroscedastisity-consistent covariance matrix (column 3).

**Table IV.7. Spearman' rho Non-parametric Test for Correlation Between Dynamic Incentives and the Dynamics of Borrower's Income Flows**

			<i>Dynamics of borrower's income flows (question 45, App. B)</i>
<b>Spearman' rho</b>	<i>Ever-increasing loans (question 30.1, Appendix B)</i>	Sig. N Correlation Coefficient	.021 95 .236**

\*\* Correlation is significant at the .05 level

**Table IV.8. FORA: Selection Process: Ordinal Logit Model**

<b>FORA</b>	Number of obs =	83
	Wald chi2(10) =	8.51
	Prob > chi2 =	0.5791
	Pseudo R2 =	0.0427
Log pseudo-likelihood = -70.629722		

Group	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]	
<b>Borrower's</b>						
Risk Type (1)	-.3232822	.6160571	-0.52	0.600	-1.530732 .8841675	
<b>Borrower's</b>						
Risk Type (2)	-.1894961	.6651866	-0.28	0.776	-1.493238 1.114246	
Information	.1680185	.2624877	0.64	0.522	-.346448 .682485	
Education (1)	.3886738	.9896121	0.39	0.695	-1.55093 2.328278	
Education (2)	-.0840592	.9054288	-0.09	0.926	-1.858667 1.690549	
Credit Needs	-1.20e-06	7.12e-06	-0.17	0.866	-.0000151 .0000127	
Relationship2	.3234694	1.150263	0.28	0.779	-1.931004 2.577943	
Relationship3	.5521331	1.019807	0.54	0.588	-1.446652 2.550918	
<b>Peer</b>						
Monitoring	.4403884	.3204113	1.37	0.169	-.1876062 1.068383	
Peer Pressure	-.1254469	.3564074	-0.35	0.725	-.8239925 .5730987	
<b>(Ancillary parameters)</b>						
Intercept 1	-3.801075	2.314504				
Intercept 2	-.4987406	2.003007				
Intercept 3	3.115749	1.993463				

The table presents the results from the ordered logit model used to test hypothesis 1 (equation (1)). The coefficients (column 2) are maximum likelihood estimates. The robust standard errors are calculated by using the White heteroscedasticity-consistent covariance matrix (column 3).

**Table IV.9. FORA: Binary Logit Model of Internal Delinquency**

FORA		Number of obs = 77		Wald chi2(9) = 9.06		Prob > chi2 = 0.4313	
Log pseudo-likelihood = -38.891463				Pseudo R2 = 0.1987			
Internal Delinquency	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]		
<b>Peer Support</b>	<b>.5474602</b>	<b>.3263818</b>	<b>1.68</b>	<b>0.093</b>	<b>-.0922364</b>	<b>1.187157</b>	
Dynamic Incentives	.5702758	.3966596	1.44	0.151	-.2071627	1.347714	
Borrower's Risk Type (1)	.8444777	.8859706	0.95	0.341	-.8919928	2.580948	
Borrower's Risk Type (2)	.5253006	.7491116	0.70	0.483	-.942931	1.993532	
Peer Pressure	-.4513092	.4197576	-1.08	0.282	-1.274019	.3714006	
<b>Peer Monitoring</b>	<b>.7303952</b>	<b>.3417173</b>	<b>2.14</b>	<b>0.033</b>	<b>.0606417</b>	<b>1.400149</b>	
Business Correlation	-.1771169	.218069	-0.81	0.417	-.6045243	.2502906	
<b>Loan Duration</b>	<b>-.616561</b>	<b>.360226</b>	<b>-1.71</b>	<b>0.087</b>	<b>-1.322591</b>	<b>.089469</b>	
<b>Social Ties</b>	<b>-.4850131</b>	<b>.2345239</b>	<b>-2.07</b>	<b>0.039</b>	<b>-.9446716</b>	<b>-.0253546</b>	
Intercept	3.417296	1.92108	1.78	0.075	-.3479513	7.182543	

The table presents the results of a binary logit model of internal delinquency (equation (2)). The coefficients (column 2) are maximum likelihood estimates. The robust standard errors are calculated by using the White heteroscedastisity-consistent covariance matrix (column 3).

**Table IV.10. FORA: Binary Logit Model of External Delinquency**

FORA		Number of obs = 71		Wald chi2(8) = 13.81		Prob > chi2 = 0.0868	
Log pseudo-likelihood = -29.803514				Pseudo R2 = 0.3218			
External Delinquency	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]		
<b>Peer Support</b>	<b>.6321933</b>	<b>.373016</b>	<b>1.69</b>	<b>0.090</b>	<b>-.0989047</b>	<b>1.363291</b>	
Dynamic Incentives	.6608324	.4209025	1.57	0.116	-.1641214	1.485786	
Group Quality	.5962906	.6787536	0.88	0.380	-.7340419	1.926623	
<b>Peer Pressure</b>	<b>-.9662346</b>	<b>.5156597</b>	<b>-1.87</b>	<b>0.061</b>	<b>-1.976909</b>	<b>.0444399</b>	
Peer Monitoring	.3411798	.3962043	0.86	0.389	-.4353664	1.117726	
<b>Business Correlation</b>	<b>-.5251654</b>	<b>.2396292</b>	<b>-2.19</b>	<b>0.028</b>	<b>-.9948301</b>	<b>-.0555007</b>	
<b>Loan Duration</b>	<b>-1.057977</b>	<b>.448587</b>	<b>-2.36</b>	<b>0.018</b>	<b>-1.937191</b>	<b>-.1787625</b>	
<b>Social Ties</b>	<b>-.713242</b>	<b>.2653816</b>	<b>-2.69</b>	<b>0.007</b>	<b>-1.23338</b>	<b>-.1931036</b>	
Intercept	5.476463	3.709432	1.48	0.140	-1.79389	12.74682	

The table presents the results of a binary logit model of external delinquency (equation (3)). The coefficients (column 2) are maximum likelihood estimates. The robust standard errors are calculated by using the White heteroscedastisity-consistent covariance matrix (column 3).

**Table IV.11. Group-Lending MFIs: Description of the variables**

	<i>Description</i>	<i>Frequency (%)</i>	<i>Mean (Standard Deviation)</i>
<b><i>Dependent Variable:</i></b>			
<i>Repayment Status</i>	Politomous nominal variable: 1 - Accurate Payers (groups with no repayment problems), 2 – Problem Solvers (groups with internal repayment problems), 3 – Defaulters (groups which failed to meet their repayment obligations on time)	1 – 130 ( 75.1%) 2 – 17 ( 9.8%) 3 – 26 (15.1%)	
<b><i>Independent Factors:</i></b>			
<i>Group Size</i>	Number of group members		5.8 (2.2)
<i>Gender</i>	Dummy Variable with a value of 0 if the group consists solely of women, 1 otherwise.	0 – 98 (56.6%) 1 – 75 (43.4%)	
<i>Education</i>	Categorical Variable: 1 – school, 2 – college, 3 - university	1 – 22 (12.7%) 2 – 130 (75.1%) 3 – 21(12.2%)	
<i>Written Records</i>	Dummy Variable with a value of 1 if the borrower was able to present his/her own income-expense written records before receiving the first loan, 0 otherwise	0 – 16 ( 9.2%) 1 – 157 (609.8%)	
<i>Collateral</i>	Dummy Variable with a value of 1 if the borrower reports ability to pledge a collateral, 0 otherwise.	0 – 101 (58.4%) 1 – 72 (41.6%)	
<i>Competition</i>	Score (from 1 to 5) indicating borrower’s probability to receive a loan from other financial institutions.		3.61 (1.44)
<i>Household Income Diversification</i>	Dummy Variable with a value of 1 if the borrower has alternative sources of income, 0 otherwise.	0 – 62 (35.8%) 1 –111 (64.2%)	
<i>Borrower’s Credit History</i>	Dummy Variable with a value of 1 if the client reported to have borrowed money for business purposes before joining the group-lending program, 0 otherwise.	0 – 139 (80.3%) 1 – 34 (19.7%)	

**Table IV.12. Group-Lending MFIs: Multinomial Logistic Regression**

	<i>Accurate Payers vs. Problem Solvers</i>	<i>Problem Solvers vs. Defaulters</i>	<i>Accurate Payers vs. Defaulters</i>
<i>Explanatory Variables:</i>	<i>Coefficient (Robust Std Errors)</i>	<i>Coefficient (Robust Std Errors)</i>	<i>Coefficient (Robust Std Errors)</i>
Intercept	-1.670042 (1.159953)	1.804554 (1.431367)	.1345117 (1.082639)
Group Size	-.0329959 (.1135154)	<b>-.2568233**</b> <b>(.142663)</b>	<b>-.3026962***</b> <b>(.1044494)</b>
[Rahmen10]	<b>-1.128808*</b> <b>(.6601388)</b>	<b>1.619565**</b> <b>(.7428152)</b>	.4812555 (.3965636)
Education (1)	.6644122 (1.076743)	-1.297219 (1.324176)	-.4308541 (.7532189)
Education (2)	.6858214 (.8005435)	-1.00981 (.9751469)	-.4776721 (.6106699)
Borrower's Credit History	.1194092 (.6074882)	-.0700899 (.7788187)	-.2850313 (.3819184)
Household Income Diversification	-.1384464 (.2376139)	-.0100794 (.4172964)	-.1485257 (.3565987)
Collateral	<b>-1.775328**</b> <b>(.7128338)</b>	<b>1.690226**</b> <b>(.8179753)</b>	-.0851015 (.4728636)
Number of obs = 186 Wald chi2(14) = 26.22 Prob > chi2 = 0.0243 Pseudo R2 = 0.0856 Log_pseudo-likelihood = -121.383			

\*\*\*Significance at 1% level; \*\*Significance at 5% level; \*Significance at 10% level

The table presents the parameter estimates of the separate logistic regressions of the multinomial logit model. I compare, in succession, 1) problem solvers with accurate payers, 2) problem solvers with defaulters, and 3) defaulters with accurate payers. The coefficients are maximum likelihood estimates. The robust standard errors are calculated by using the White heteroscedasticity-consistent covariance matrix.

**Table IV.13. MBG Batumi: Description of the key variables**

The questions (Appendix B) used for constructing the variables are in parentheses, column 1.

	<i>Description</i>	<i>Frequency (%)</i>	<i>Mean (Standard Deviation)</i>
<b><i>Dependent Variables:</i></b>			
<i>Borrower's Risk Type</i>	Categorical Variable: 3 - Low risk borrowers 2 – Intermediate risk borrowers 1 – Higher risk borrowers	3 – 21 (22.1%) 2 – 49 (51.6%) 1 – 25 (26.3%)	
<i>Repayment Performance</i>	Number of installments paid by the borrower in advance over the total number of contributed installments.		
<b><i>Independent Variables:</i></b>			
<i>Screening Costs (Question 17)</i>	Number of meetings between the borrower and the loan officer prior to the loan disbursement.		2.391 (1.667)
<i>Credit Needs (Question 15)</i>	Actual credit needs		2946.05 (1952.09)
<i>Education</i>	Dichotomous Variable: 0 – secondary school or college 1 - university	0 – 61 (60.4%) 1 – 40 (39.6%)	
<i>Written Records (Question 27)</i>	Dichotomous Variable with a value of 1 if the borrower was able to present his/her own income-expense written records before receiving the first loan, 0 otherwise	0 – 31 (30.7%) 1 – 70 (69.3%)	
<i>Industry Sector</i>	Dichotomous Variable: 0 – production 1 – trade & services	0 – 66 (65.3%) 1 – 35 (34.7%)	
<i>Collateral (Question 12)</i>	Score (from 1 to 5) indicating how much time and efforts it would take the borrower to restore the collateral in case the bank seized it.		3.45 (1.13)
<i>Dynamic Incentives</i>	The difference between the actual credit needs of the borrower and the value of the loan received, expressed as a percentage of the loan amount: $\frac{CreditNeeds - LoanSize}{LoanSize}$		0.80 (1.09)
<i>Competition (Question 10)</i>	Dichotomous Variable taking a value of 1 if the client reported to know other financial institutions in the region he/she could borrow money from.		2.65 (1.48)
<i>Income Diversification (Question 22)</i>	Score (from 1 to 5) indicating how much the alternative income sources exceed the income from the business project.		1.61 (.86)
<i>Borrower's Credit History (Question 20)</i>	Dichotomous Variable with a value of 1 if the client reported to have borrowed money for business purposes before joining the lending program of MBG, 0 otherwise.	0 – 74 (72.5%) 1 – 28 (27.5%)	

**Table IV.14. MBG: Ordered Logit Model of Borrowers' Probability of Success**

<b>MBG Batumi</b>		Number of obs =		99	
		Wald chi2(4) =		4.92	
		Prob > chi2 =		0.2952	
		Pseudo R2 =		0.0241	
Log pseudo-likelihood = -100.10234					
-----					
Borrower's Risk Type	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
-----					
<b>Screening Efforts</b>	<b>.256786</b>	<b>.1275675</b>	<b>2.01</b>	<b>0.044</b>	<b>.0067583 .5068137</b>
Education	.2970942	.4898641	0.61	0.544	-.6630218 1.25721
Industry Sector	.0397173	.3179168	0.12	0.901	-.5833881 .6628228
Written Records	-.1023359	.4516666	-0.23	0.821	-.9875861 .7829143
-----					
Intercept 1	.1518408	1.187274	(Ancillary parameters)		
Intercept 2	2.466685	1.213019			
-----					

The table presents the results from the ordered logit model used to test hypothesis 3 (equation (4)). The regression coefficients are listed in column 2. The robust standard errors calculated by using the White heteroscedastisity-consistent covariance matrix are shown in column 3. The z-statistics and the p-values are presented respectively in columns 4 and 5.

**Table IV.15. MBG Batumi: Tobit Model of Borrowers' Repayment Performance**

<b>MBG Batumi</b>		Number of obs =		92	
		Wald chi2(6) =		23.64	
		Prob > chi2 =		0.0006	
Log pseudo-likelihood = -57.397712					
-----					
Repayment Performance	Coef.	Robust Std. Err.	z	P> z	[95% Conf. Interval]
-----					
<b>Collateral Dynamic Incentives</b>	<b>.1135741</b>	<b>.0387953</b>	<b>2.93</b>	<b>0.003</b>	<b>.0375366 .1896116</b>
<b>Borrower's Risk Type</b>	<b>.1008585</b>	<b>.0349025</b>	<b>2.89</b>	<b>0.004</b>	<b>.0324509 .1692662</b>
<b>Income Diversification</b>	<b>.1578087</b>	<b>.0647202</b>	<b>2.44</b>	<b>0.015</b>	<b>.0309595 .2846579</b>
<b>Borrower's Credit History</b>	<b>.0994986</b>	<b>.051626</b>	<b>1.93</b>	<b>0.054</b>	<b>-.0016865 .2006837</b>
Competition	.0430619	.0962837	0.45	0.655	-.1456506 .2317744
Intercept	.006889	.0310511	0.22	0.824	-.0539702 .0677481
	-.6278609	.2553391	-2.46	0.014	-1.128316 -.1274054
-----					
Observation summary:		68	uncensored observations		
		24	left-censored observations		

The table presents the results from the tobit model of borrowers' repayment performance used to test hypothesis 4 (equation (5)). The regression coefficients are listed in column 2. The robust standard errors calculated by using the White heteroscedastisity-consistent covariance matrix are shown in column 3. The z-statistics and the p-values are presented respectively in columns 4 and 5.

**Table IV.16.** Individual vs. Group-Lending: Description of the variables used in the econometric model

	Description	Frequency (%)
<b>Dependent Variable:</b>		
<i>Individual or. Group Lending Contract</i>	Dummy Variable = 1 if the borrower is a client of MBG Batumi; = 0 if the borrower is a client of Constanta.	0 – 11 ( 0%) 1 - 115 (90%)
<b>Independent Variables:</b>		
<i>Business Development</i>	Score (from 1 to 5) indicating how well the borrower’s business project has developed since the disbursement of the first loan.	3.97 (.495)
<i>Education</i>	Dichotomous Variable: 0 – secondary school or college 1 - university	0 – 77 (64%) 1 – 44 (36%)
<i>Interest Rate</i>	Dichotomous Variable = 1 if the borrower would have taken a loan at an interest rate of 5 – 8%, 0 otherwise.	0 – 127 (96%) 1 – 5 ( 4%)

**Table IV.17.** Individual vs. Group Lending: Binary Logit Model

		Number of obs	=	126
		Wald chi2(3)	=	15.75
		Prob > chi2	=	0.0013
		Pseudo R2	=	0.1729
Log pseudo-likelihood = -36.35528				
-----				
Individual or		Robust		
Group Lending	Coef.	Std. Err.	z	P> z
				[95% Conf. Interval]
-----				
<b>Interest rate</b>	<b>-2.35874</b>	<b>.9112711</b>	<b>-2.59</b>	<b>0.010</b>
Education	.251415	.6822037	0.37	0.712
<b>Business</b>				
<b>Development</b>	<b>1.590841</b>	<b>.6310934</b>	<b>2.52</b>	<b>0.012</b>
Intercept	-4.391869	3.095708	-1.42	0.156
				-10.45935
				1.675608

The table presents the results from the binary logit model defined in equation (6). The regression coefficients are listed in column 2. The robust standard errors calculated by using the White heteroscedastisity-consistent covariance matrix are shown in column 3. The z-statistics and the p-values are presented respectively in columns 4 and 5.



**Table IV.18.** Group vs. Individual Lending: Clients' Satisfaction with the Loan Services

	Group Statistics				
	Individual or Group Lending	N	Mean	Std. Deviation	Std. Error Mean
<i>Satisfaction with the Repayment Schedule</i>	Constanta	103	3.74	.91	8.94E-02
	MBG Batumi	121	4.05	.77	7.03E-02
<i>Satisfaction with the Loan Size</i>	Constanta	103	3.35	.84	8.24E-02
	MBG Batumi	120	3.93	.94	8.55E-02

	t-test for Equality of Means				
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
<i>Satisfaction with the Repayment Schedule</i>	-2.777	222	.006	-.31	.11
<i>Satisfaction with the Loan Size</i>	-4.846	220.692	.000	-.58	.12

Notes: This table presents the t-test for equality of means. The null hypothesis states that the difference between the two sample means for each of the tested variables is zero.  $t = \frac{\text{sample\_one\_mean} - \text{sample\_two\_mean}}{\text{std\_error\_of\_the\_difference\_in\_means}}$ . Similar results are found using the non-parametric signed rank test.

**Table IV.19.** Group vs. Individual Lending: Clients' Satisfaction with the Loan Services (only borrowers who have sufficient assets to pledge as collateral)

	Group Statistics				
	Individual or Group Lending	N	Mean	Std. Deviation	Std. Error Mean
<i>Satisfaction with the Repayment Schedule</i>	Constanta	11	3,82	0,87	0,26
	MBG Batumi	121	4,05	0,77	7,03E-02
<i>Satisfaction with the Loan Size</i>	Constanta	11	3,45	0,69	0,21
	MBG Batumi	121	3,93	[Rahmen 11]	[Rahmen 12]

	t-test for Equality of Means				
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
<i>Satisfaction with the Repayment Schedule</i>	-0,941	130	0,349	-0,23	0,25
<i>Satisfaction with the Loan Size</i>	-1,624	129	0,107	-0,47	0,29

# Appendix B

## Questionnaire

### (Group-Lending MFIs)

Name: \_\_\_\_\_

1) Gender:

1 – male

2 – female

2) Education:

1 – university

2 – college

3 – high school

3) Industry sector:

1 – trade

2 – services

3 – production

4) How long have you been living in Batumi: \_\_\_\_\_ years

5) Loan size: \_\_\_\_\_

6) Loan term: \_\_\_\_\_

7) Repayment scheme (weekly, biweekly, monthly, etc.): \_\_\_\_\_

8) Interest rate of the current loan: \_\_\_\_\_

9) Loan cycle: \_\_\_\_\_

10) Number of members in your credit group: \_\_\_\_\_

11) First information about the MFI?

commercial

self-initiative

friends

loan officer

12) Are there other reliable financial institutions close to your place, which provide the same services, including loan granting?

Yes

No

If yes, how easily can you borrow from them? Rate from 1 (very easily) to 5 (impossible to switch to them).

1

2

3

4

5

13) What kind of relationship does exist between the members of your group?

1 – relatives

2 – friends

3 – business partners

4 – cosigners

14) Please, reply *yes*, *no*, or *I do not know*.

– Are the members of your credit group around the same age?

yes

no

I don't know

- Are all group members the same sex?  
 yes       no       I don't know
  - Do the members of your credit group have the same level of education?  
 yes       no       I don't know
  - Did the members of your credit group have the same occupation before starting their own businesses (teachers, medics, engineers, etc.)?  
 yes       no       I don't know
  - Do the group members have roughly the same level of wealth?  
 yes       no       I don't know
  - Have all members of your group lived in Batumi for more than 10 years?  
 yes       no       I don't know  
 If no, how many of them moved here (or out) recently? \_\_\_\_\_
  - Does your group meet for any other reason than for loan servicing?  
 yes       no       I don't know
- 15) Not taking into account the joint-liability contract do any mutual business interests exist between you and your peers (e.g. mutual trading activities, common clientele, common suppliers, etc.)? Please, evaluate the degree of correlation between your businesses.
- 1 – no correlation at all;       4 – strong correlation;  
 2 – very weak correlation;       5 – extremely strong correlation.  
 3 – weak correlation;
- 16) How many members of the group did you know before joining the program? \_\_\_\_\_
- 17) When you joined the credit group, how well did you know the business projects of your partners? Please, rate from 1 (no information at all) to 5 (detailed information)
- 1       2       3       4       5
- 18) How would you evaluate the reliability of your partners' business projects at the time the group was formed? Please, rate from 1 (all businesses quite risky) to 5 (all businesses quite safe):
- 1       2       3       4       5
- 19) How often do you meet your group partners?
- 1 – one or two times a month;       4 – three or four times a week;  
 2 – one or two times a fortnight;       5 – every day.  
 3 – one or two times a week;
- 20) How often do your partners discuss their business problems within the group? Please, rate from 1 to 5:
- 1 – never;       4 - quite often,  
 2 - very seldom;       5 – regularly.  
 3 – occasionally;

- 21) How well can you observe the outcome of your partners' business activities (e.g. their revenues and expenses written accounts, their cash flow, etc.)? Please, rate from 1 to 5:
- 1 - no information at all;                       4 - quite well;  
 2 - not very well;                               5 - extremely well.  
 3 – well;
- 22) Has your group ever been late with the repayment of the weekly installments?
- Yes                       No
- 23) Have there been cases in your group when a borrower declared inability to repay on time but the group did not violate the official repayment schedule with the MFI because the members covered his/her debt; helped him/her overcome the problem by offering labor support, for example; made him/her repay under the threat of sanctions, etc.?
- Yes               No                       I don't know

*The following questions address only groups with repayment problems. If your group has never experienced a repayment problem, please, answer hypothetically: how would you or your group react if a member defaulted.*

- 24) Does your credit group exert pressure on partners who report repayment problems? (e.g. threaten them, let them know that they will face certain unpleasant consequences, etc.) How strong is the pressure? Rate from 1 to 5:
- 1 - no pressure;                       4 - strong pressure;  
 2 – very weak;                       5 - extremely strong pressure.  
 3 – weak;
- 25) Does your credit group pay for delinquent peers?
1. No, we all stop paying.  
 2. No, we simply pay our parts and leave their loans in arrears.  
 3. Yes, but only if the default was caused by uncontrollable factors (drought, flood, illness).  
 4. Yes, but only if they defaulted for the first time.  
 5. Yes, always
- 26) What kind of problems does a person with arrears face?
1. She/ He does not face any problems. We pay for her/him and usually do not make her/him give us back the money.  
 2. We pay for her/him and hope that one day she/he will repay us.  
 3. We pay for her/him, she/he remains a member of our group but is forced to repay.  
 4. We pay for her/him but she/he is excluded from the group and placed in a new one.  
 5. We pay for her/him but she/he is excluded from the group and the lending program.

27) What kind of consequences does a group with arrears face?

- 1 – The group receives further loans but the size of the loans does not increase.
- 2 - The members with arrears are kicked out of the program and the group receive further loans.
- 3 – The group is eventually forced to repay and its members receive further loans.
- 4 - The group dissolves and the accurate members join other groups.
- 5 – All group members are excluded from the program.

28) After the loan disbursement, how often do you meet your loan officer?

- 1 – less than once a month;     4 – once a week;
- 2 – one or two times a month;     5 – two or three times a week.
- 3 – one or two times a fortnight;

29) Please, rate from 1 (it is of no importance) to 5 (extremely important) **each** of the following statements. Reasons for repaying:

- You do not want to lose the access to future loans.  
 1                     2                     3                     4                     5
- You want to stay on good terms with the group.  
 1                     2                     3                     4                     5
- You want to avoid problems with the loan officer and the bank overall.  
 1                     2                     3                     4                     5

30) Please, rate from 1 (it is of no importance for you) to 5 (extremely important for you) **each** of the following statements:

- The possibility to receive ever-increasing loans  
 1                     2                     3                     4                     5
- The possibility to receive loans at lower interest rate  
 1                     2                     3                     4                     5
- Longer terms to maturity  
 1                     2                     3                     4                     5
- Lower transaction costs  
 1                     2                     3                     4                     5

31) Use the following scale to indicate the efforts, time, direct and indirect financial costs you have invested in gathering information about your group partners, meeting them, and solving common problems:

- 1 \_\_\_\_\_  2 \_\_\_\_\_  3 \_\_\_\_\_  4 \_\_\_\_\_  5
- no costs    moderate    extremely high costs

32) How much time it took you to apply for and receive the loan? \_\_\_\_\_ days

33) How well does the loan repayment schedule fit your cash flows? Rate from 1 to 5,

- 1 – doesn't fit at all                                   4 – quite well;
- 2 – not quite well     5 – extremely well;

- 3 – well;
- 34) How well does the loan cover your business needs? Rate from 5 to 1,  
 1 – doesn't fit at all                       4 – quite well;  
 2 – not quite well                               5 – extremely well;  
 3 – well;
- 35) How much from the weekly cash flow do you use in order to cover the weekly installments?  
 1 – a very small part;                               4 – quite a big part;  
 2 – a small part;                                       5 – nearly the whole amount;  
 3 – nearly the half;
- 36) Assume that there were no constraints on the loan size. How much would you have borrowed?  
\_\_\_\_\_ (in USD)
- 37) Have you ever received a credit from other sources than the MFI?  
 Yes                       No
- 38) Do you have any other sources of income? (e.g. salaries, other small businesses, income from an apartment rented, etc.)?  
 Yes                       No
- 39) The income of your business project in comparison to the whole family income is:  
 1 - much smaller;                               4 – bigger;  
 2 – smaller;                                       5 - much bigger.  
 3 - nearly the same;
- 40) Please reply *yes* or *no*. Why did you choose a join-liability loan?  
–            You did not have any collateral to pledge.  
 Yes, I had a collateral,  
 No, I did not have any  
–            To make a favor to a member of your credit group.  
 Yes                       No
- 41) When you applied for the loan were you able to provide income–expense written records?  
 Yes                                       No
- 42) Please, write the rough monthly income of your household including all income sources (in USD)?  
 1 - Up to 50 USD  
 2 - From 50 to 100 USD  
 3 - From 100 to 150 USD.  
 4 - From 150 to 200 USD  
 5 - More than 200 USD

43) Please, indicate the average monthly income from your main business (in USD)?

- 1 - Up to 50 USD
- 2 - From 50 to 100 USD
- 3 - From 100 to 150 USD
- 4 - From 150 to 200 USD
- 5 - More than 200 USD

44) How has your business project developed since you received the first loan from the MFI?

- 1 – quite badly;
- 2 – not very stable;
- 3 – stable;
- 4 – quite stable;
- 5 – extremely stable.

45) How has your monthly business income changed since the first loan disbursement?

- 1 decreased significantly;
- 2 decreased slightly;
- 3 no changes;
- 4 increased slightly,
- 5 increased substantially.

46) If your business develops successfully would you like to apply in future for an individual loan, or you prefer to further stay with the group?

- Yes, I would like to apply for an individual loan,
- No, I prefer to stay with the group

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

# Appendix C

## Questionnaire

### (Individual Lending MFIs)

Name: \_\_\_\_\_

1) Gender:

1 – male

2 – female

2) Educational level:

1 – university

2 – secondary school

3 – no education

3) Industry sector:

1 – trade

2 – services

3 – production

4) How long have you been living in Batumi: \_\_\_\_\_ years

5) Loan size: \_\_\_\_\_

6) Loan term: \_\_\_\_\_

7) Repayment scheme (weekly, biweekly, monthly, etc.): \_\_\_\_\_

8) Interest rate of the current loan: \_\_\_\_\_

9) How many times have you received a loan from the MFI? \_\_\_\_\_

10) Are there other reliable financial institutions close to your place, which provide the same services, including loan granting?

Yes

No

I do not know

If yes, how easily can you borrow from them? Rate from 1 (very easily) to 5 (impossible to switch to them).

1

2

3

4

5

11) What is the rough value of the collateral you pledged? \_\_\_\_\_ (in USD)

12) How much time and efforts it would take you to restore the collateral in case the bank seized it? Rate from 1 to 5.

1 – very easily

4 – quite difficult

2 – easily

5 – impossible to restore it

3 – difficult

13) How well does the loan repayment schedule fit your cash flows? Rate from 1 to 5,

1 – doesn't fit at all;

4 - quite well;

2 – not quite well;

5 – extremely well.

3 – well;



- 14) How well does the loan cover your business needs? Rate from 5 to 1.
- 1 – doesn't fit at all;                       4 - quite well;
- 2 – not quite well;                               5 – extremely well.
- 3 – well;
- 15) Assume that there were no constraints on the loan size. How much would you have borrowed?  
\_\_\_\_\_ (in USD)
- 16) How much time it took you to apply for and receive the first loan? \_\_\_\_\_ days
- 17) How many times did you meet your loan officer before the loan was disbursed? \_\_\_\_\_
- 18) When you take important decisions about your business project how often do you contact your loan officer? Please, evaluate from 5 to 1
- 1 – never                       4 – very often
- 2 – seldom                       5 – always
- 3 – often
- 19) In case of default how do you think the loan officers would act?
- 1 - will not seize the collateral if the default is caused by uncontrollable forces (drought, flood, illness, death, etc.)
- 2 - renegotiates and grants a new loan, hoping that this will help the delinquent borrower recover his/her business and repay the entire debt
- 3 - reschedules the repayment without seizing the collateral if the borrower proves that the problem is temporary
- 4 - seizes the collateral but gives it back in case of late repayment
- 5 - immediately seizes the collateral
- 20) Have you ever received a credit from other sources than the MFI?
- Yes                       No
- 21) Do you have any other sources of income? (e.g. salaries, other small businesses, income from an apartment rented, etc.)?
- Yes                       No
- 22) The whole family income in comparison to the income of your main business project is:
- 1 - much smaller                       4 - bigger
- 2 – smaller                       5 - much bigger
- 3 - nearly the same
- 23) The monthly income of your family is (in USD):
- 1 - Up to 100 USD
- 2 - From 100 to 200 USD
- 3 - From 200 to 400 USD
- 4 - From 400 to 600 USD
- 5 - More than 600 USD

24) The monthly income from your main business is (in USD):

- 1 - Up to 200 USD
- 2 - From 200 to 300 USD
- 3 - From 300 to 400 USD
- 4 - From 400 to 600 USD
- 5 - More than 600 USD

25) How has the income from your main business changed after the first loan disbursement?

- 1 - decreased significantly     4 - increased slightly
- 2 - decreased slightly                       5 - increased significantly
- 3 - no changes

26) How stable has your business developed since you received the first loan from the MFI?

- 1 –quite badly                                       4 – quite stable
- 2 – not very stable                       5 – extremely stable
- 3 – stable

27) When you applied for the first loan were you able to provide income – expense written records?

- Yes                       No

28) Have you had during the current loan circle temporary repayment problems, so that it was very difficult for you to repay on time your installments?

- Yes                       No

If yes, how many times? \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

# Appendix D

## Factor and Cluster Analyses

### Factor Analysis

Part of the variables used in the analysis enters the equations as factor analysis scores. The factors were extracted by applying the confirmatory factor analysis (also called principle axis factoring). I specified a priori the number and the labels of the factors and had clear expectations about which initial variable on which factor would load.

The initial and the extracted communalities of all indicator variables are listed in TableD.1. Table D.2 provides some measures of the appropriateness of the factor analysis. *Bartlett's test of sphericity* indicates the statistical probability that the correlation matrix has significant correlations among at least some of the variables. In all three cases the null hypothesis is accepted at more than 99% confidence level. Another index of the degree of intercorrelations among the variables is the *measure of sampling adequacy*. It ranges from 0 to 1, reaching 1 when each variable is perfectly predicted without error by the other variables. With an index ranging between .600 (FORA) and .745 (Constanta) the sampling adequacy can be interpreted as middling.

Table D.3 shows how much of the total variance is explained by the extracted factors: 49.7% in Constanta, and 41.5% in FORA. Taking into account the applied method of principal axis factoring<sup>33</sup> it can be defined as acceptable. Finally, Table D.4 presents the factor loadings that were extracted by using the Varimax Rotation Method. Varimax rotation is an orthogonal rotation of the factor axes to maximize the variance of the squared loadings of a factor on all the variables in a factor matrix. It minimizes the number of variables, which have high loadings on any one given factor. Each factor will tend to have either large or small loadings of particular variables on it. The Rotated Factor Matrix clearly shows which variables on which factors load. It indicates that the correlation between the pre-selected variables and the respective factors is sufficiently high. In Constanta, contrary to the expectations, the variables *frequency of meetings*, *discussing business problems within the group*, and *information on peers' business outcome* turned out to be statistically uncorrelated and that is why they did not load on a single factor.

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<sup>33</sup> Principal factor analysis (PFA) seeks the least number of factors, which can account for the common variance of a set of variables, whereas the more common principal component analysis (PCA) in its full form seeks the set of factors, which can account for all the common and unique variance in a set of variables. PFA uses a correlation matrix in which the diagonal elements are not 1's, as in PCA, but estimates of the communalities. These estimates are the squared multiple correlations of each variable with the remainder of variables in the matrix.

**Table D 1. Communalities**

	Community	
	Initial	Extracted
<b>Constanta:</b>		
<i>Group Pressure</i>	0.296	0.567
<i>Consequences from group default for the defaulting member</i>	0.245	0.378
<i>Consequences from group default for the group</i>	0.211	0.277
<i>Ever-increasing loans</i>	0.404	0.442
<i>Lower interest rates</i>	0.542	0.668
<i>Longer terms to maturity</i>	0.506	0.606
<i>Lower transaction costs</i>	0.53	0.618
<b>FORA:</b>		
<i>Frequency of meetings</i>	0.276	0.307
<i>Discussing business problems within the group</i>	0.442	0.694
<i>Information on Peers' Business Outcome</i>	0.405	0.556
<i>Group Pressure</i>	0.321	0.352
<i>Consequences from group default for the defaulting member</i>	0.427	0.751
<i>Consequences from group default for the group</i>	0.223	0.255
<i>Ever-increasing loans</i>	0.311	0.646
<i>Lower interest rates</i>	7.74E-02	0.105
<i>Longer terms to maturity</i>	0.239	0.294
<i>Lower transaction costs</i>	0.165	0.192

Extraction Method: Principal Axis Factoring

**Table D 2. KMO and Bartlett's Test**

		Constanta	FORA
<i>Kaiser - Meyer - Olkin Measure of Sampling Adequacy</i>		.745	.600
<b>Bartlett's Test of Sphericity</b>	<i>Approx. Chi-Square</i>	197.304	154.681
	<i>df</i>	21	45
	<i>Sig.</i>	.000	.000

**Table D 3. Total Variance Explained**

Factor	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Comulative %	Total	% of Variance	Comulative %
<b>Constanta:</b>						
1	2.773	39.608	39.608	2.363	33.761	33.761
2	1.762	25.165	64.773	1.193	17.041	50.802
3	0.715	10.213	74.986			
4	0.577	8.24	83.226			
5	0.492	7.032	90.259			
6	0.377	5.392	95.651			
7	0.304	4.349	100.000			
<b>FORA:</b>						
1	2.213	22.126	22.126	1.558	15.585	15.585
2	1.791	17.908	40.034	1.396	13.964	29.549
3	1.678	16.783	56.817	1.199	11.992	41.541
4	0.854	8.543	65.359			
5	0.813	8.133	73.493			
6	0.794	7.942	81.435			
7	0.633	6.33	87.764			
8	0.505	5.051	92.815			
9	0.377	3.767	96.582			
10	0.342	3.418	100.000			

**Table D 4. Factor Loadings**

	<i>Factors:</i>		
	<i>Peer Monitoring</i>	<i>Peer Pressure</i>	<i>Dynamic Incentives</i>
<b>Constanta:</b>			
<i>Group Pressure</i>		0.735	
<i>Consequences from group default for the defaulting member</i>		0.601	
<i>Consequences from group default for the group</i>		0.522	
<i>Ever-increasing loans</i>			0.816
<i>Lower interest rates</i>			0.782
<i>Longer terms to maturity</i>			0.773
<i>Lower transaction costs</i>			0.663
<b>FORA:</b>			
<i>Frequency of meetings</i>	0,824		
<i>Discussing business problems within the group</i>	0,735		
<i>Information on Peers' Business Outcome</i>	0,507		
<i>Group Pressure</i>		0,832	
<i>Consequences from group default for the defaulting member</i>		0,580	
<i>Consequences from group default for the group</i>		0,504	
<i>Ever-increasing loans</i>			0,778
<i>Lower interest rates</i>			0,450
<i>Longer terms to maturity</i>			0,432
<i>Lower transaction costs</i>			0,317

Rotation Method: Varimax with Kaiser Normalization

### Cluster Analysis

In the analysis of the group-lending mechanism (FORA and Constanta) the variable *borrower's risk type* is computed as a cluster analysis score. The analysis was performed based on information about the average monthly income from the borrower's business project, borrower's own assessment of the stability of his project, and the dynamics of the borrower's income flows (respectively questions 43, 43, and 45, Appendix B). The clusters were derived by the Wald's method, an agglomerative clustering algorithm. This method is regarded as one of the most efficient because it uses an analysis of variance approach to evaluate the distances between clusters. It attempts to minimize the Sum of Squares of any two (hypothetical) clusters that can be formed at each step.

**Table D 5. Variables used in the cluster analysis**

Borrower's Monthly Business Income			Income growth after the loan disbursement			Development of the borrower's business project		
in USD	Nr. of Borrowers (%)			Nr. of Borrowers (%)			Nr. of Borrowers (%)	
	<i>FOR A</i>	<i>Const.</i>		<i>FOR A</i>	<i>Const.</i>		<i>FOR A</i>	<i>Const.</i>
< 50	12,8	15,5	Decreased significantly	0	0	Quite bad	1,7	0
50 – 100	23,1	29,9	Decreased slightly	0	0	Not very stable	0	0
100 – 150	17,1	26,8	No changes	47,1	3,1	Stable	3,3	40,2
150 – 200	21,4	11,3	Increased slightly	47,9	72,9	Quite stable	70,6	51,5
> 200	25,6	16,5	Increased significantly	5	24	Very stable	24,4	8,2

**Table D 6. T- and F-values**

	<i>T- values:</i>			<i>F- values:</i>		
	Cluster 1	Cluster 2	Cluster 3	Cluster 1	Cluster 2	Cluster 3
<b>Constanta</b>						
<i>Borrower's Monthly Business Income</i>	1,3846	-0,1000	-1,0308	0,182421	0,142786	0,153864
<i>Development of the borrower's business project</i>	-0,0645	0,3226	-0,4032	0,909293	1,268171	0,657438
<i>Income growth after the loan disbursement</i>	-0,2708	0,5000	-0,5000	0,913824	0,876226	[Rahmen 13]
<b>FORA</b>						
<i>Borrower's Monthly Business Income</i>	1,2662	0,4964	-0,9353	0,0000	0,2420	0,2657
<i>Development of the borrower's business project</i>	1,0000	-0,0678	-0,4068	0,4323	0,7349	0,8818
<i>Income growth after the loan disbursement</i>	0,3594	-0,1719	-0,0156	0,6133	1,7192	0,6059