Good or bad clients?

An exploratory research to success and failure factors of micro borrowers
in Moldova

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Abstract: This thesis is an exploratory research to success and failure factors of Moldovan micro lenders. Research about the 'classical' microfinance sector is not always directly applicable on the Moldovan microfinance sector, because it differs in loan size and competition. This thesis forms a set of hypotheses about client performance, based on findings in the classical microfinance sector, but also on the Moldovan context. In the second part of this thesis, the hypotheses are tested within the case Dinar Capital, a small Moldovan MFI. The tests are both quantitatively and qualitatively. Although the tests did not give very convenient results, some insights are gained in the success and failure factors of Moldovan micro lenders.

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1. INTRODUCTION

1.1 TWO DIFFERENT MICROFINANCE SECTORS

Since several decennia, the market for microfinance in developing countries has enormously increased. In 1997, the first microcredit summit held in Washington DC recognized microfinance as being a very important instrument in poverty alleviation. The UN nominated the year 2005 as the International Year of Microcredit, which resulted in more attention from governments, NGOs and banks. (UN, 2005) There is a large group of economically active poor people that is self-employed or has the ability to become self-employed with credit. However, this group often has no access to adequate financial services. The absence of a financial market for this group of clients is caused by very high transaction costs because of information asymmetry and a lack of collateral. (World Bank, 2011) The rise of the so-called microfinance institutes (MFIs) that experimented with new mechanisms like group lending and other financial innovations, was seen as very promising for development. (Morduch, 1999) Besides offering small loans, they also offered other financial services like insurances and lending products. The poor were reached and the method promised to be financial sustainable in most cases. In contrast to many other poverty alleviating projects, the persistence of microfinance seemed not to be constrained by uncertainty about funding. Some success stories from Bangladesh, Bolivia and India showed that MFIs were more able to provide credit for this missing market than the large and inefficient credit provision projects of governments. (Navajas et al. (2000), Khandker (2005), Puhazhendhi et al. (2000))

Mix Market, an organisation that collects data from MFIs all over the world, registered more than 2000 microfinance institutes. (MIX Market, 2012a) Yet, these organisations are just a share of all MFIs worldwide. Within the market for microfinance, there are commercial and non-commercial players. A quite outdated research of the World Bank found that in 1995, of the 1000 MFIs that were active, more than half of them was a NGO. However, the NGOs accounted for only 9% of the portfolio. (Paxton, 1996) The commercial institutions serve more clients and offer larger loans. The question may arise: what makes 'microfinance', microfinance? MIX market defines microfinance as:

Microfinance services – as opposed to financial services in general – are retail financial services that are relatively small in relation to the income of a typical individual. Specifically, the average outstanding balance of microfinance products is no greater than 250% of the average income per person (GNI per capita)(MIX market, 2010)

Besides MFIs in the 'classical' developing countries, also in the developed countries a market for microfinance started. (Zecchini, 1996 and Massey&Lewis, 2003) In the north of the United States, New Zealand and in Western Europe, the common commercial banks provide loans for small businesses, with about the same loan conditions as for 'common' loans. However, also special MFIs arose. These MFIs are a NGOs and have a more narrow market compared to the 'classical MFIs'. They serve very specific groups, for example a remote rural area, handicapped people, people from a specific religion or other (disadvantaged) sub-populations. The similarity between these MFIs and 'classical' MFIs is the main aim: poverty alleviation and job creation, though in a more specific subgroup. A difference between both kinds of MFIs is the market they face. The market for MFIs in developed countries is smaller because:

1. Compared to a 'classical' developing country, a relatively smaller proportion of the population is self-employed.

2. Compared to a 'classical' developing country, the financial system is better developed and more able to overcome transaction costs in providing small loans.
3. Compared to a 'classical' developing country, the national social safety net may discourage self-employment. (Zecchini, 1996)

For the microfinance sector in 'classical' developing countries, a lot of research is done on impact, sustainability and outreach. Conversely, the findings from that research are not all applicable to the MFIs formed in the developed countries. This thesis will deal with a case in-between the microfinance sector in developing and developed countries: the microfinance sector of Moldova.

1.2 CHARACTERISTICS OF THE MOLDOVAN MICROFINANCE SECTOR

1.2.1 Compared to the classical microfinance sector

On the one hand, the Moldovan microfinance sector is not similar to the microfinance sector in other developed countries (Western Europe, New Zealand and America) because Moldova has more poverty, the social safety nets are less developed and a larger share of the population is self-employed. (World Development Indicators, 2012) However, the Moldovan microfinance sector also differs from the 'classical' microfinance sector in these aspects:

1. Price levels are higher than in most developing countries with 'classical' MFIs. Therefore, *the average loan size is larger* in Moldova (see graph 1.1). In fundraising, this means that with the same fund, less clients can be served. Funders may be more critical what happens with their money, because with the same money a larger outreach can be realized in another (developing) country.

Graph 1.1 Average loan balance in USD 2010
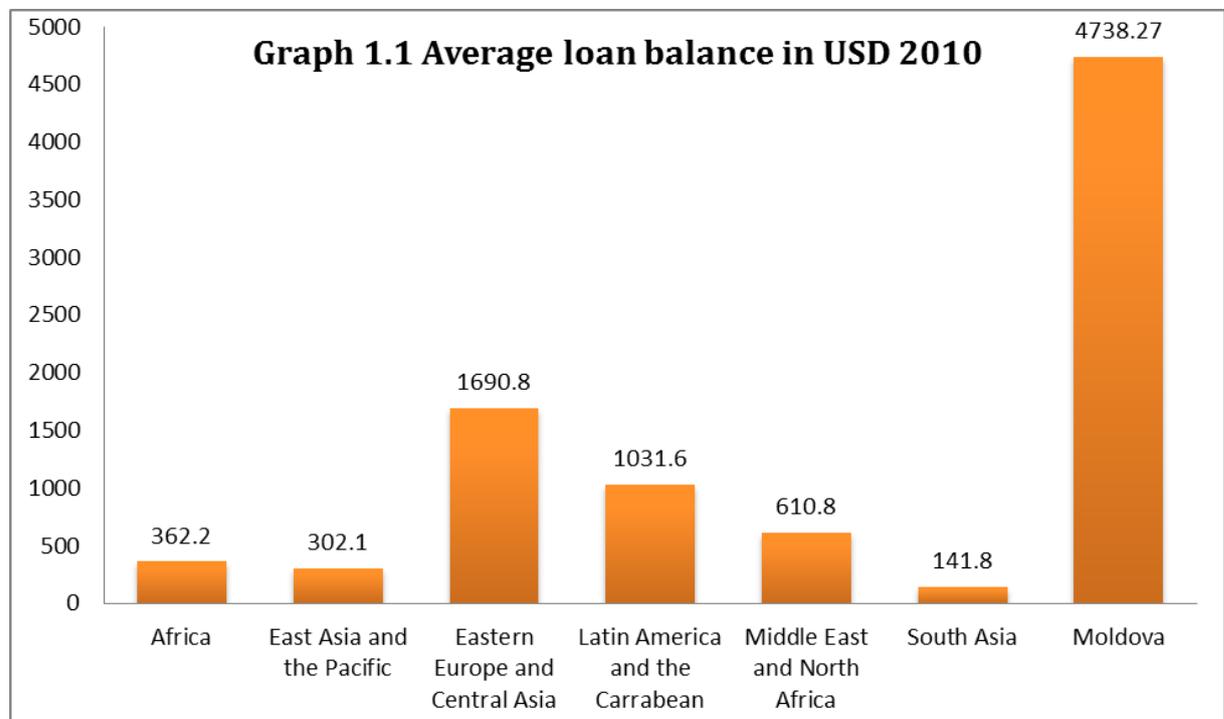
2. Moldovan MFIs are, compared to 'classical' MFIs, more integrated in and bound to the financial rules and legislation of a developed banking system. Therefore, *transactions as well as instalment conditions are more fit* in a developed banking context. Two expressions:

- o No daily, weekly or 2 weekly repayments, but repayments on monthly, quarterly or yearly basis. The reason for this is that it decreases transaction costs and that Moldovan clients do not have a lack of saving mechanisms.
  - o It is very difficult and inefficient to work with cash money. All transfers in the microfinance sector occur via the bank.
3. There is not one, but there are many microfinance suppliers. *An MFI has to compete with other MFIs and commercial banks.* Compared to a developing country in which clients do hardly have an alternative, Moldovan MFIs have to offer a very attractive loan product to gain clients. Therefore, being a self-sustainable MFI in Moldova may be more difficult compared to a MFI that has a monopoly on offering loans.

1.2.2 Suppliers in the Moldovan microfinance sector

In Moldova, there are many suppliers of microfinance. The large banks ProCredit and MicroInvest (in total about 35.000 active microloans) offer small credits for businesses in agriculture or commerce. Their microcredit program serves a commercial aim, not a social aim. (MIX Market, 2012 b) Besides these banks, there are several NGOs that are focussed on microloans and training and consultancy (not savings or other financial services). Invest Credit (600 active loans), Rural Finance Corporation (160 active loans) and Dinar Capital (100 active loans) are three of them, but several experts mentioned that there are much more small MFIs in Moldova. (MIX Market, 2012 b) That type of MFIs have the same client-types: usually clients that are active in the agricultural sector, because small businesses in rural areas face more difficulties in fulfilling the requirements of commercial banks. Although there are many similarities in the portfolio, the goals are slightly different:

Name	Goal /mission	Accent difference
Invest Credit	*Target clients that have an entrepreneurial motivation and vision, but cannot meet the requirements demanded by commercial banks for capital loans.* (Invest Credit, 2009)	Accent on entrepreneurial attitude
Rural Finance Corporation	*Promote rural development by offering favourable financial services to farmers and entrepreneurs, in line with Moldova's poverty reduction strategy.* (RFC, 2012)	Accent on rural areas
Dinar Capital	*Our goal is to transform the Moldovan society via the expansion of small (Christian) businesses.* (Tcaci, 2012)	Accent on religion of clients

Besides these differences in goals, there are differences in loan size, interest rate, conditions and in the way in which courses and consultancy are practiced.

1.3 RESEARCH QUESTION AND DESIGN

Having seen that the Moldovan microfinance sector has characteristics different from the 'classical' MFIs, questions about impact and outreach of Moldovan MFIs cannot directly be answered by findings in research on the classical MFIs. One very relevant question for an MFI is how good performing clients can be selected: what are success or failure factors for a client? The competition within the Moldovan microfinance sector and the high price levels make this question even more relevant for a Moldovan MFI. We may assume that in order to answer this question for the case Moldova, research about 'classical' MFI clients is not sufficient. Specific research has to be done in the microfinance sector of Moldova itself.

The aim of this research is to explore success and failure factors of Moldovan clients that took a microloan. The reasoning will be *deductive*, it will go from the *general* to the *particular*. The *general* is formed by hypotheses resulting from theory about the 'classical' microfinance sector and from Moldovan contextual information. The *particular* is the empirical information of Moldovan micro lenders. The empiric data is gathered in the small Moldovan MFI Dinar Capital. I used this MFI as case because I had access to this organization. A threat to the external validity of this research is the difference in clients of Dinar Capital compared to the 'average Moldovan MFI client'. There are two main differences: (1) The loans of Dinar Capital are smaller than the average Moldovan microloan ($1517 according to exchange rate of 23-04-2012). (2)The clients of Dinar Capital are almost all active in a protestant church, which may give a biased image if, for example, lifestyle is taken into account as explanatory factor. In this thesis, the reader has to keep in mind these threats to the external validity.

1.3.1 Research questions

<u>MAIN QUESTION</u>
What are factors that influence the success of start-up businesses in Moldova after receiving microcredit?

<u>PART A</u>
Based on literature, what hypotheses can be made about failure/success factors for small businesses?
1. What hypotheses from experience of the 'classical' MF sector?
   - Hypotheses about personal factors
   - Hypotheses about activity-related factors
2. What hypotheses from the Moldovan context?
   - Hypotheses based on the macroeconomic situation
   - Moldovan accents in hypotheses about personal and activity-related factors mentioned in 1a

<u>PART B</u>
Can we find these factors in the empirical case 'Dinar Capital'?
3. Which hypotheses can be tested with what kind of data sources?
4. What are the factors that influence the success or failure of a small business?
   - Factors observed in quantitative and qualitative data (chapter 4)
   - Factors observed in qualitative data (chapter 5)

1.3.2 Operationalization

Success
In these questions, the term 'success' needs to be operationalized. 'Success' is used in this thesis in two ways:
1. Success for the business (high revenue, many clients, good profit, job creation)
2. Success for the MFI (client repays the loan and interest on time)

There is a relation between both operationalization options, but we do distinguish them because a client with a successful business, can still have a lack of an *incentive to repay* and be a non-successful client in the second operationalization. The word 'success' in the framework of questions refers to the second definition. However, because it is confusing to use both

definitions together, the second definition will be described as 'successful in repaying' in the rest of this thesis.

Start-up business
Start-up businesses are businesses that used the loan to start up a whole new business or a new activity. All informants of data for part B, received the start-up loan of Dinar Capital at least half a year ago, so the first performance and repayment results are already known.

Hypotheses
Hypotheses are statements that predict the influence of factors on repayment success. For each hypothesis the reader should add 'keeping all other factors equal'.

1.3.3 Data collection and critical reflection

Part A of the research is a literature study, combined with information from two interviews. Sources for the first part are found in (scientific) journals, books, online databases (see references for specific sources) and unstructured interviews with staff of two Moldovan MFIs: Tcaci (2012) of Dinar Capital and Popa (2012) of Invest Credit. The outcome is a set of 25 hypotheses that are ordered in two different dimensions. Those are (1) according to the way they affect repayment performance (*capacity to repay, incentive to repay*) and (2) according to the group of factors they belong to (*personal, activity-related, regional*).

Part B tests the hypotheses found in part A by looking at the empirics. The initial plan was to test the hypotheses in a statistical model and, after that, to look beyond the success and failure factors by in-depth interviews with clients. Unfortunately, two problems resulted in a change of plans:

1. The hypotheses found in part A are not all testable with data, because the **administration was not very extensive.** There was, for example, no extensive data on how the clients do their business, data like 'risk attitude', 'energy use' etc. missed. To correct for this, the in-depth interviews were focussed on these topics. However, one may question the representativeness of those in-depth interviews. Given time and weather constraints, only seven respondents could be interviewed. That sample should be a very good representation of all clients (purposive sampling). In the sense of personal characteristics and activity, this worked out well, but not in the sense of the dependent variable: repayment performance. None of the interviewed clients had any amounts due, because it was socially not acceptable to ask bad clients for an interview. The respondents give insight in factors that may affect their *capacity to repay,* but whether it really affects repayment is questionable. Moreover, the factors that affect the *incentive to repay* are not testable in this way.

2. The data that was available in the administration of Dinar Capital, did not give enough adequate data to test the testable variables in a model, so there were **hardly any significant test results**. The data selection process is described in chapter 3. Therefore the decision is made to analyse the data in another way. The drawback of these alternate analyses is that it violates the internal validity of the research. When a model is tested, alternate explanations can be taken into account, but by just comparing successfulness and some other variables it is not proven that there is a causal relation between both factors. Therefore the results described in the second part of part B are plausible, but not scientific proves of the hypotheses.

The red line through this thesis is a chart of factors that influence success/failure. This represents the hypotheses formed in chapter two, and it will finally illustrate the conclusion on the main question of this research project in chapter 6.

PART A: LITERATURE REVIEW

2. LITERATURE STUDY

2.1 EXPERIENCE FROM 'CLASSICAL' MICROFINANCE SECTOR

After about 35 years of experiences in the micro finance sector, a whole range of studies is published about sustainability and outreach of MFIs. One aspect of sustainability is the type of clients that is selected. Several studies give insight in attractive and less attractive characteristics of MFI clients. Basic economic research about repayment predictions (eg. Ray, 1998) uses two variables in the formula: 'high-risk vs. low-risk' and 'outside option'. This research is exploratory, so it will search for the factors behind the variables risk/uncertainty and outside options. Therefore, we state that repayment performance of a client depends on two factors:

- Its capacity to repay (which refers to the risk and uncertainty the client faces/takes)
- Its incentive to repay (which refers to the attractiveness of the outside option)

The *capacity to repay* is determined by the success of the business. The *incentive to repay* is determined by how attractive it is for a client to be good repayment performer. The factors that work both via the *capacity and the incentive to repay* can be split up in 3 groups: personal factors, activity-related factors and region-related factors. The third group will not be considered in this section, but more specifically for Moldova in section 2.2. The aim of this section is to form hypotheses based on information from literature.

2.1.1 PERSONAL CHARACTERISTICS

2.1.1.1 Gender

In many MFI programs, women are targeted above men. The Microcredit Summit Campaign (Daley-Harris, 2009) states that in 2007 of all MFI clients, 70% was women. Of all very poor MFI clients, 83.2% was women. Why are women targeted above men? The famous Grameen Bank started with more male clients than female clients, but after some decades female clients increased significantly to 96.1% of all clients in December 2011. (Grameen Bank, 2011) One of the reasons is that experiences show that women have a higher repayment rate. (eg. Khandker et al, 1995) What are the factors lying behind this higher repayment rate? Reasons mentioned by Armendáriz and Morduch (2010) are:

- Women have less alternative credit sources and less access to the labor market. Therefore self-employment and the value of credit is very high. Their *incentive to repay* is high.
- Women are poorer than men, partly explained by less access to capital. Returns to capital are higher for women, so a loan is invested more efficiently.
- Women are less mobile. Both formal monitoring, but also peer-review is easier and the social sanction on strategic default is higher. This makes women act less risky in doing investments.

Both last points show a positive effect on the *capacity to repay* for female clients. A condition for this better performance is that the women themselves fully control the loan, not their male household members. Another drawback of a female client is that in times of crisis, women will more easily use the loan for consumption aims or money that originally would be used for

household consumption is now used to cover loan costs. (Goetz&Gupta, 1996) However, based on the trend that women are better in repaying than men we may hypothesize:

> *Hypothesis 1: A female client is more successful in repaying than a male client*

2.1.1.2 Health and lifestyle

Idiosyncratic shocks like diseases can have a bad effect on the success of a small business. Fofana (2010) found that in Cote d'Ivoire HIV/AIDS negatively affects MFIs via a low repayment rate. In her research she found that some MFIs refuse HIV/AIDS affected clients. A disease does not only negatively affect the repayment via work capacity, but it also discourages the *incentive to repay* (because long term possibilities like access to future loans is less important). Therefore, many MFI's combine their credit services with trainings, sometimes also health related trainings or education. (White & Robinson, 2000)

> *Hypothesis 2: A healthy client is more successful in repaying than an unhealthy client*

2.1.1.3 Level of poverty

A general trend is that not the very poor, but the less poor are more able to run a business, so less poor clients are better clients via the *capacity to repay*. (Wright & Dondo, 2001) The impact on alleviating poverty is assumed to be larger if the very poor get credit. This group usually has a lack of skills and experience in a profitable sector, so is more risky for the MFI. This group needs more than credit and business skills, it also needs training and consultancy about sectoral information. Often, this group is involved in non-differentiable and non-profitable activities. Special credit products have to be designed for this group in order to serve them in a sustainable way, but qua profitability, it is more attractive for an MFI to attract clients that are less poor. (Wright & Dondo, 2001)

> *Hypothesis 3: A less poor client is more successful in repaying than a very poor client*

2.1.1.4 Social capital and networks

Social capital, which is the value of social networks in which the client participates, affects the ability to repay the loan via two ways: the *capacity and the incentive to repay*. Group lending or working with referees and guarantees is an often used method of MFIs because it reduces monitoring costs. A client without a network to form a proper group or to get a referee or a guarantee, will not get a loan. Being member of a valuable network increases the *incentive to repay*, because you have to be careful with your reputation. (Armendáriz & Morduch, 2010)

There are two positive effects on the *capacity to repay:* first, it is shown that social capital is a positive determinant of self-employment earnings, so being member of useful networks is essential for micro entrepreneurial success. (Gomez & Santor, 2001) Second, in case of negative events, a client with a good social network is more likely to find help in repaying than a client without such a network.

> *Hypothesis 4: Social capital, coming from membership of social networks, positively affects the repayment*

2.1.1.5 Credit history/status

The credit history/status of a client shows the occurrence or absence of both the *capacity to repay* and *the incentive to repay.* In case of a good credit history/status, the client already got the image of a trustable client, so he will lose more in case of strategic default. In many cases it is difficult to get insight in the credit status of the client, especially if there is a network of informal lenders and no credit bureau that registers all loans. In a study of Bangladesh it is found that access to more loan providers (so multiple loans per client) causes due payments. (Chaudhury and Matin, 2001) There are more outside options, so the value of credit from one specific MFI is not very high, if there is a second MFI that keeps offering a loan. Moreover, dealing with multiple disbursement schedules may cause difficulties in cash flows. Asking a client to clarify its credit status, is an easy option to gather information, but the information will not always be true. Morduch and Armendariz (2010) mention that lending to a group decreases the probability of a bad credit history, because the members know each other and usually have more than only financial ties.

Ghosh and Ray (1999) designed a model of a credit market without collateral and credit history in which the clients cannot be trusted. Their suggestion is to give loans based on inside reputation mechanism. So a first loan is not really attractive, but when it is repaid properly, the second loan will be more attractive and so on. In that way the incentive to repay will always be higher than default because of the achieved status.

Concluding, a good credit history/status increases the *incentive to repay*. If there is no information available, the MFI should not take too much risk, but design loan products that increase the incentive to repay, for example via group mechanisms.

> *Hypothesis 5: A client with a positive credit history/status is more successful in repaying than a client without or with a bad client history/status*

2.1.2 ACTIVITY RELATED CHARACTERISTICS

2.1.2.1 Property of the client

What are the initial assets and reserves of the client and in what assets will he invest the money? The assets and (financial) reserves of a client are expected to affect both the *incentive to repay* and the *capacity to repay*. A useful investment and/or useful initial financial and non-financial assets will contribute to the success of the business itself, which positively affects repayment via the *capacity to repay.* Although microfinance suppliers often do not require collateral (there is often a lack of collateral) it is not uncommon to ask for collateral in the non-traditional way. Almost all household or business items are considered as collateral if they reflect much value for the client, even if the cash value of the asset is not high enough. If in case of default, the client's house or business will be claimed through the court, it will not solve cost problems for the MFI but it is a strong incentive for the client to prevent due payments. (Armendariz & Morduch, 2010)

> *Hypothesis 6: Ownership of valuable properties (in the eyes of client) positively affects the repayment*

2.1.2.2 Type of business activity

According to Waterfield and Duval (1996), there are three primary sectors in which microenterprises are operating: agriculture, production and services. The division of risk for business failure, so an absence of the *capacity to repay*, differs among and within sectors. This has to do with several differences:

Differences in vulnerability to shocks: Besides personal shocks, there are activity-related shocks which the whole sector is vulnerable to. The *agricultural* sector is dependent of good weather circumstances. The *services* sector will face extra effects of shocks in the economy (for example inflation or recession). The production sector also has activity-related shocks, dependent on the activity the client is involved in. When selecting clients, the risk related to their activity should be taken into account. In general, the production sector can be considered as less risky for an MFI, because of better collateral possibilities in case of absence of the *capacity to repay*. (Ledgerwood, 1998)

Differences in profitability: Often clients have small business, so they have no influence on input and output prices. The circumstances differs per sector, but also within sectors. Market information constraints, underdeveloped infrastructure, disability to specialize and a lack of added-value services can make unstable survivors of the clients. Based on theory, it is not possible to make general statements like 'of all sectors, the agricultural sector is most sensitive to low sales prices', but such statements can be made on a local level, taking the activities of the businesses more specifically into account. (Ledgerwood, 1998) When selecting clients, the *capacity to repay* can be estimated.

Differences in income sources: If a client has more income sources, for example because he differentiated his activities, that income sources may buffer drawbacks in the activity for which he took the credit. This increases the capacity to repay.

In short, there has not been research resulting in clearness about general sector related factors in success and failure, but we find that:

Hypothesis 7: A client working in the production sector (manufacturing) is more successful in repaying than a client working in the agriculture- or services sector because it has more collateral possibilities
Hypothesis 8: A client with a specialized activity is more successful in repaying than a client without specialization (provided that there is a market for its product/service)
Hypothesis 9: A client with multiple sources of income is more successful in repaying than a client of which the business is his only source of income

2.1.3 ILLUSTRATION OF HYPOTHESES FROM 'CLASSICAL' FACTORS

The set of hypotheses resulting from the experience from the 'classical' microfinance industry, are illustrated in chart 1. The number between brackets is the hypothesis the factor refers to. For the factor 'sector' it is not possible to make a testable hypothesis, because it depends too much on the region. The personal factors are underlined in orange, the activity related factors in red. This chart will be expanded with regional information in chapter 3.
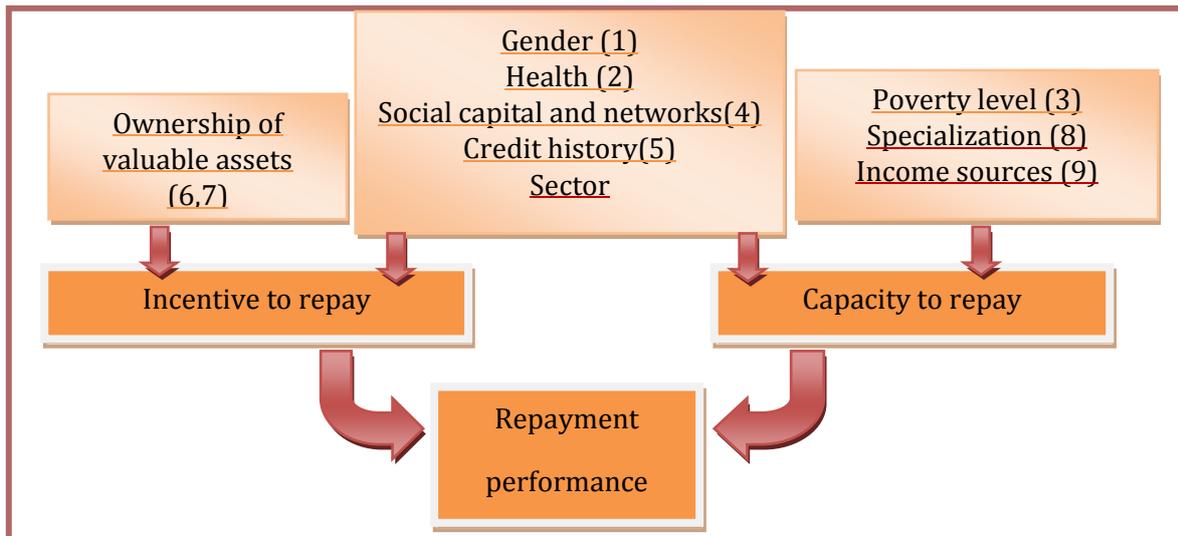
Chart 1: Illustration of hypotheses from 'classical' microfinance literature

2.2 PREDICTIONS FOR THE MOLDOVAN CONTEXT

As already mentioned in the introduction, the Moldovan microfinance sector differs from the 'classical' microfinance sector. Therefore we can continue our search for appropriate hypotheses by reviewing the Moldovan context. Two sources of information are used in this chapter. In the first section data about the Moldovan history and macroeconomic performance is used to add some hypotheses about typical Moldovan failure and success factors. In the second section there are two case studies about the selection methods that Moldovan MFIs use to accept new clients. They base their criteria on experience and on traditional working methods, so it gives a good insight in contextual information on micro scale. This section will add some hypotheses and question the relevance of hypotheses made in section 2.1. We will again split the factors up in influencing the *capacity to repay* and the *incentive to repay* and update the chart with the new hypotheses.

2.2.1 EFFECT OF HISTORY AND MACROECONOMIC PERFORMANCE

In August 1939, the Molotov-von Ribbentrop pact recognized the Moldovan area, as Soviet sphere of influence (Olson, 1994). Therefore, the Soviet Union officially claimed this region until the dissolution of the Soviet Union in 1991, when Moldova declared itself an independent state. The Soviet history has nowadays still a major impact on Moldova. Compared to countries which do not have a Soviet history, several remarkable differences can be mentioned that are relevant for the performance of micro businesses.

2.2.1.1 History

Under authority of the centralized Soviet system, the last generations of Moldova missed education and experience which is very useful in a market-led economy. 'Normal people' that were not part of the highest authorities, were not used to think about efficiency. During the Soviet period, new initiatives and responds to opportunities were seen as an threat, because it undermined the plans of the highest authorities. The only incentive was to follow up commands and preferably produce somewhat extra. Until 1991, this was officially integrated in the economic system, but after the introduction of the free market, the population is still not fully entrepreneurial in nature. It has less experience in taking risk, taking responsibility, making good cost-benefit analyses and other skills that are useful when running a business in a market-led economy. This decreases the *capacity to repay*. (Ericson, 1991) Therefore, it can be predicted that:

> *Hypothesis 10: Clients with modern and innovative businesses are more able to repay than old-fashioned and traditional clients*

Rozelle and Swinnen (2004) distinguished three factors that affect economic performance in an article about the reform strategy in transition countries and its effects on the economy. These factors played a role in almost all transition economies, so also in Moldova. They partly determine the opportunities and constraints for small businesses:

- Firstly, there was a transition in the *production and marketing and supply structure* resulting from a change in prices and subsidies. In the Soviet areas quantities were planned and prices were an accounting instrument, they did not affect demand. The large organized production forms fell down and there was a large need for new ways to generate income. This easily

could be filled up with self-employment or employment in small businesses, so the value of credit was high. With a high validation of credit, the *incentive to repay* is large because it increases the probability of getting new credit. Therefore, the change in production organization increased the *incentive to repay*.

Especially in the agricultural and the industrial sector, this transition has an enormous impact on the profitability. The terms of trade for agricultural enterprises in CEE countries declined because of falling domestic and international demand, reduced domestic subsidies and the collapse of the Council of Mutual Economic Assistance (Comecon). (Swinnen&Gow, 1999) Therefore, the country's ability to compete with world market prices was low. In providing credit, this low profitability increases risks because it diminishes the repayment rates via the *capacity to repay* a loan.

- Secondly, there was a transition of *property rights*, which caused in a lack of collateral. As already described in chapter 1, collateral is used to stake the wealth of the clients. In former Soviet countries there was a low appraisal value for assets because of incomplete property rights, legal enforcement problems and difficult ownership transfer procedures. Commercial credit institutions react on it by credit rationing, non-commercial credit institutions (NGO's) that want to serve clients with a lack of collateral, will face extra risks because it decreases the *incentive to repay.*

- Besides these impacts on the *capacity and the incentive to repay*, it is important to consider the *liberalization and development of market institutions* in Moldova. Under the Soviet regime, banks were dependent on the Central Bank and had the role to provide money for planned economic activities. With the transition of the financial system, the role of banks shifted from fiscal to intermediation. (Swinnen&Gow, 1999) One of the intermediation tasks is credit provision. Before the transition, there was also credit provision, but for unsuccessful enterprises to give them a helping hand. This credit was provided with no or a negative interest rate and the aim was to help the enterprise to become successful again (Mc Kinnon, 1991). The role and the costs of credits changed tremendously which was difficult to understand for clients as well as banking staff. The skills of banking staff had to shift to credit scoring instead of credit provision.

These transition movements started about 20 years ago. In the literature until about 2000, the heritage of the Soviet time is described in detail. For example, Mc Nulty (2001) found that the amount of financial intermediations in former Soviet countries is significantly lower than in other transition economies in similar level of development. In 2001 he expected that this brings serious constraints for small entrepreneurs in getting credit. Most of the literature about these transition effects is written until 2000, but how is the situation nowadays? That will be discussed in the next section.

2.2.1.2 Macroeconomic performance

The transition of the Moldovan economy from 1991 until now, marks several issues problematic for the performance of clients of MFIs. The issues will be ordered according to the three factors relevant in transition, as described in the last section.

Production and marketing- and supply-structures

Migration
Nowadays, the level of organized agricultural and industrial activity is still low. The services sector is the main sector in Moldova (77% of GDP according to World Development Indicators).

A new way to generate income has become popular: labour migration. Official migration figures already show a high migration rate (table 2.1), but estimates of (seasonal) labour migration tell that a quarter of the Moldovans work abroad and send remittances to their family. (Sander et al, 2005) The ease in which Moldovans can migrate and the habit of much people to do so, decrease the *incentive to repay*, because there is an outside option different from self-employment (with credit).

Hypothesis 11: Clients with possibilities and incentives to migrate have a worse repayment performance than clients without that possibilities and incentives

Table 2.1 Indicator/year	1995	2000	2005	2010
Net migration (% of total population)	-120756 (3.2%)	-252500 (14.4%)	-320000 (8,9%)	-171748 (4,8%)

Source: World Development Indicators, 2012

Unstable GDP

The economy of Moldova is still quite unstable (graph 2.1). The growth of the GDP per capita was in the first years after dependence very volatile and negative. Last years the situation improved, but still it is not very certain and stable. GDP growth says something about the countries future growth prospects. If the growth is negative or unstable, this may lead to a decrease in demand so a possible failure factor for a small business, especially in the services sector. (Yaron, 1997)

Hypothesis 12: Clients working in the services sector have a worse repayment performance because of GDP instability compared to clients working in other sectors
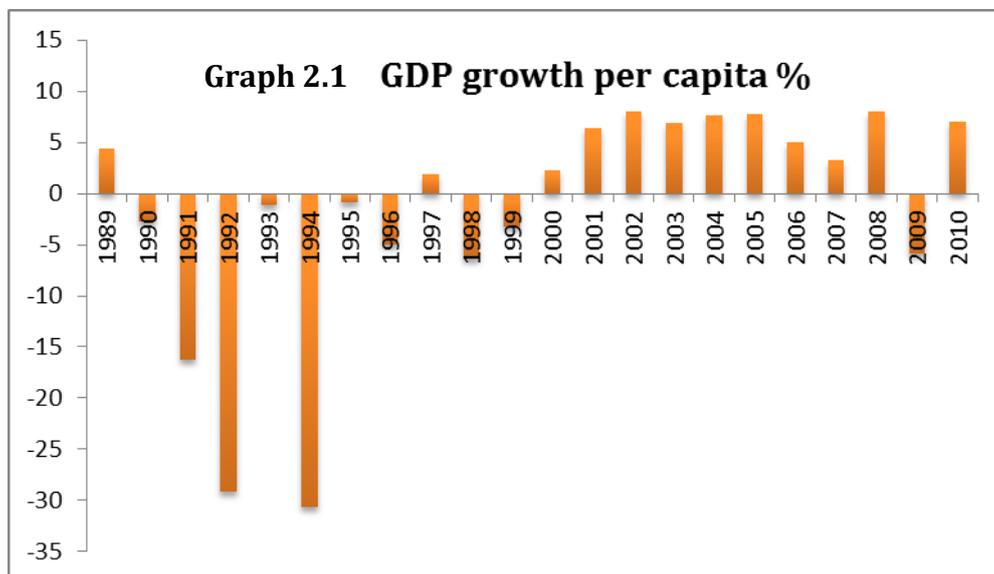
Source: World Development Indicators, 2012

Inflation

The introduction of prices and an own currency (MDL) resulted in a high inflation (table 2.2). The devaluation of the Russian rouble in 1998 resulted in an inflation of 39.9% in 1999. Nowadays the yearly inflation rate is still higher than 10%. (World Development Indicators, 2012) The decrease of the value of money will, in most cases, be counted in the interest rate. Therefore, the client has to cover that costs which, together with the rise of input prices from imported products, negatively affects its *capacity to repay*. If a client produces for the world

market its *capacity to repay* is larger, because the value added of his activity is higher in the local currency. Concluding we may hypothesize:

> *Hypothesis 13: Clients that use imported products as input and/or do not sell their product to the world market have a worse repayment performance than clients that use domestic inputs and/or produce for the world market*

Table 2.2 Indicator/year	1995	2000	2005	2010
Inflation (consumer prices %)	29,86	31,30	11,96	12,77

Source: World Development Indicators, 2012

Trade across borders
Moreover, the high inflation rate and economic relations with surrounding countries also cause a bad position for Moldovan businesses to trade across borders. In the Doing Business rate of 2012 Moldova ranks 134 (out of 186 countries), especially because many documents and much time is needed to import/export goods. (World Bank, 2012 b) Businesses that need imported products for import or planned to produce for the world market are constrained by this bad performance. We may assume that a client considered this before he started his business, so he took the constraints into account in his business plan, however, uncertainty on this terrain can still negatively affect its *capacity to repay.*

> *Hypothesis 14: Clients who import and/or export goods for their businesses have a worse repayment performance than clients that buy and sell on the domestic market*

High energy prices
Moldova has barely natural resources, the most valuable is agricultural land. Before independence, almost all energy and other raw material was imported from Russia and Ukraine, but as an independent country, it has to buy energy from Ukraine and Russia. Because of several conflicts with those countries, Moldova faces very high energy prices which has a negative impact on the economy (Baclajanschi et al, 2007). In the ease of doing business, Moldova ranks 160th out of 186 countries on 'getting electricity' (World Bank, 2012 b). This is negative for the *capacity to repay* of clients that need energy in the production process.

> *Hypothesis 15: Clients that are involved in an activity in which much energy is used have a worse repayment performance than clients that do not need energy in their business activity*

Corruption
Corruption and political instability are still large problems in Moldova (Carasciuc, 2001). The World Economic Forum did a survey among businessmen of, especially, small businesses in 142 countries about (among others) some indicators about constraints in doing business. The outcome of the survey (table 2.3 and graph 2.2) shows that political instability is the most problematic factor in doing business for Moldovan businessmen, followed by corruption. The Moldovan businessmen are quite critical about their government. Political instability affects the *capacity to repay* via uncertainty. Corruption affects the *incentive to repay* via the mentality and complexity in juridical procedures. Therefore we may hypothesize:

> *Hypothesis 16: Clients that are affected by corruption and political instability have a worse repayment performance than clients that are not affected by it*

Table 2.3 Category (Rank is based on weighted average of questions, World n=13395, Moldovan n=108, calculation methods available in source report)	Rank (out of 142)
Irregular payments and bribes	102
Reliability of police services	121
Transparency of government policy making	66
Efficiency of legal framework in challenging regulations	100
Protection of minority shareholders' interest	116

Source: Schwab, 2011
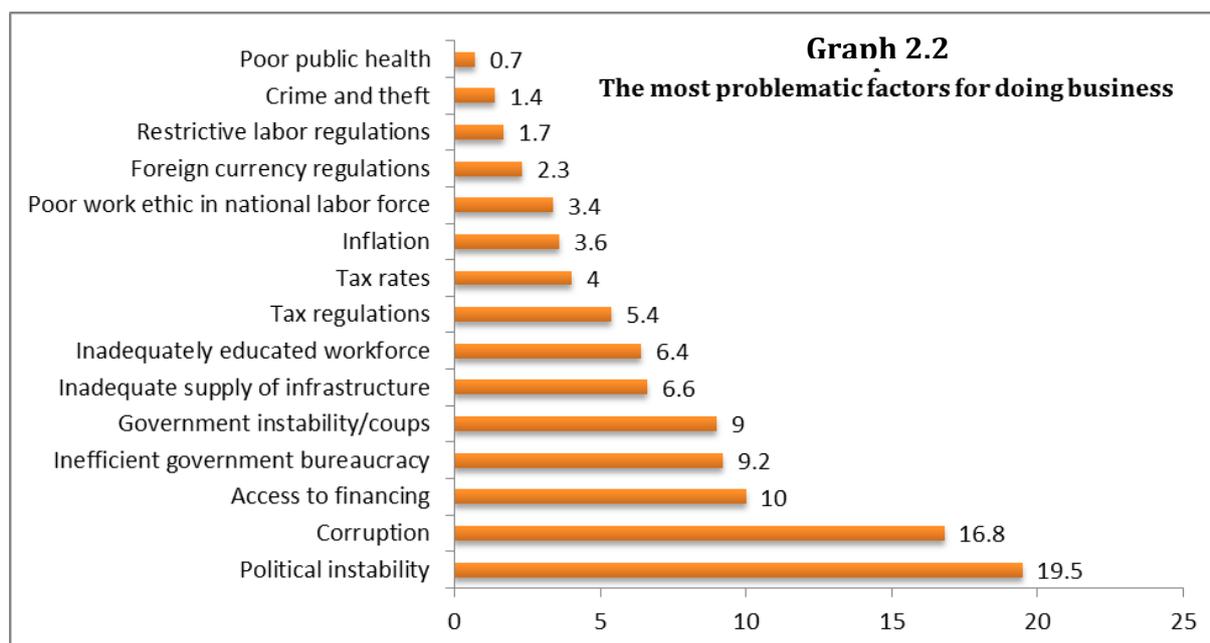
Source: Moldova Country Profile from the Global Competitiveness Report (Schwab, 2011)

Property rights and collateral possibilities

It is difficult to find recent objective data about property rights and collateral possibilities in Moldova. Vazdautan (2012) says that in the agricultural sector, the process of land distribution is finished. Property rights are clear and to a certain extend there is a market for land. This is a good collateral for clients from the agricultural sector. The value of one hectare of land is on average about $1300, so it is a good collateral option.

For the other sectors, equipment or personal properties can be used as collateral. On the Doing Business ranking, Moldova ranks 18 on registering property. That is very good, especially when compared to the other scores in this list of indicators. But registering property is not necessarily respecting property and more collateral possibilities. In the survey of the World Economic Forum, Moldova scores 3.3 on a scale of 7 (117th country out of 142) in the security about property, which is not very good. However, we may assume that property rights are better defined compared to 20 years ago, especially for larger businesses. (see graph 2.2)

The average collateral requirement in Moldova is 138.61% (result from enterprises survey of the World Bank, 2009). Probably this requirement covers the risk which financial institutions bear by providing credit. We may assume that this, combined with the charged interest rate, also covers the (juridical) costs to seize the collateral. As already described in the introduction, the target group of the Moldovan MFI sector may be on people that have no access to credit because of a lack of collateral. Because property rights seem to be secured, this group may be relatively smaller in Moldova, but there is no remarkable difference between clients without collateral in

Moldova or another country caused by differences in property rights. Therefore we will not change hypothesis 6 which was formed in the first chapter.

Hypothesis 6: Ownership of valuable properties (in the eyes of client) positively affects the repayment

Table 2.4 Indicator	Score and scale	Method	Source
Ease of doing business Registering property	Country rank 18 (out of 186)	Based on the number of procedures, time and costs to register property	World Bank, 2012b
Global Competitiveness report Questions about property rights	3.3 on scale of 7 Country rank 117 (out of 142)	Survey weighted average, n=108	Schwab, 2011
Idem question about possibility to get credit without collateral with good business plan	2.3 on scale of 7 Country rank 109 (out of 142)	Survey weighted average, n=108	Schwab, 2011

Financial sector

The state of the Moldovan credit sector was discussed with Popa (2012), the chief loan officer of an MFI of average size in Chisinau (about 700 active clients, see also case study 1 in the next section). Although not all inhabitants of Moldova understand the working of a bank in a capitalistic market, Popa mentiones that the banking system works similar to the Western European banking system. He gave one example of an aspect that is still underdeveloped: the credit bureau in Chisinau. A credit bureau is a private firm or a NGO that maintains a data basis with the credit history of the financial systems. Usually a credit bureau is transparent and easy usable for all financial institutions in a country. However, in Chisinau there is only one credit bureau which has a very high fee. Only a few big Moldovan banks are client of this credit bureau, but smaller MFI´s cannot afford to pay the fee. The consequence is missing objective information of the credit history of clients. Therefore, we change hypothesis 5, made in chapter 1 to:

Hypothesis 5: A client with a provable positive credit history/status is more successful in repaying than a client without a provable good credit history/status

2.2.2 MICRO FACTORS THAT INFLUENCE REPAYMENT PERFORMANCE

Moldovan problems and accents in the factors that influence success and failure can be hypothesized by the macro factors like history and the performance of the economy, as is done in the last section. However, the experience of MFIs itself about factors that influence repayment performance is also very useful information. In this section, the client selection methods of two Moldovan MFIs will be illustrated in cases. Although those case studies are part of the empirics, I decided to mention these cases in part A (hypotheses forming part) and not in part B (hypotheses testing part) because the experience of the MFIs is quite subjective and the focus is sometimes biased. By taking it into account in this chapter, their assumptions will be tested.

Case study 1: Invest Credit

Source: a non-structured interview with Dan Popa (Chief Loan Officer of Invest Credit)

Invest Credit is an MFI with 516 active borrowers (2012). It started in 1998 and achieved operational sustainability in 2003. Its main office is in Chisinau and its clients live in different regions in Moldova. Before an applicant gets a loan, Invest Credit follows this procedure:

1. **The first contact**. Often applicants are attracted by a successful story of someone they know. Other applicants are attracted by field promotion.
2. **The first meeting**. A first meeting will be arranged with the applicant and a loan officer, at a local place or in the office. The loan officer explains the products that are offered (size, interest rate, conditions). It is important that the loan officer checks whether the applicant understands what the contract means. Especially applicants from a rural area did never sign a contract and they possibly do not understand what they commit when signing such a contract.
3. **A visit to the business**. The loan officer visits the business of the applicant (for a start-up business the place where the business will be started). There are several indicators with which the repayment performance can be predicted. The loan officer 'checks' the applicant using these indicators:
   a. Does the applicant have a wife/husband and children? (being married and having children usually shows that the applicant has a stable life, so less chance for default)
   b. What is the age of the applicant? There is a pay off between a good health and an innovative attitude (young) and experience (old). Often people that are now older than 45 years seemed to be worse clients because they are fully educated and they started their first economic activity in the Soviet time. However, there are also stories from very successful older clients. The loan officer considers the age in the context.
   c. What is the character of the applicant, does he have a healthy lifestyle? (alcohol, reputation in neighbourhood) And in what social network does he live? Gipsies, for example, have a very good repayment rate, because reputation is very important for them. In rural areas, reputation is more important than in urban areas.
   d. What type of business does he have? The loan officer makes an estimation of the capacity of repayment. For agricultural products this is the planned amount of crops times the average price minus average costs. For much business types such estimations can easily be made. The experience of Invest Credit is that network marketing is a sector with much failure. Agricultural activities are quite successful because in a rural area reputation is more important and clients are very afraid to take risks.
   e. What assets does the applicant have? Valuable assets decrease defaulted payments, because a court can take possession of it.
   f. What is the credit history of the applicant?

Based on this information, the loan officer decides which loan product fits best. After taking a loan, clients can also participate in business trainings. The interest rate differs per loan product, but is always between 15-17%. The average loan size of their clients is $2307,54, so their average loan is smaller than the average Moldovan microloan.

Case study 2: Dinar Capital

Source: observation of one day field visits, non-structured interviews with Tcaci et al. (2012b)

Dinar Capital is a small MFI with about 100 active clients. It is founded in 2006 by a missionary organization with 'Business for Transformation' as slogan. The office is located in Chisinau and the clients live in different regions of Moldova. Before an applicant gets a loan, this is the procedure:

1. **Promotion.** The promotion of Dinar Capital happens mainly through local churches and worth of mount advertising. Usually a pastor or another person with high status advises people to become client and also advises Dinar Capital to take the applicant as a client. The involvement of a pastor is considered as very important.
2. **Business course.** After the application, all potential clients are invited to a business course of 3 days in Chisinau. On that course, they get help in writing a business plan in which they have to follow the 7 steps of the microbusiness method of the World Bank. After the course, the applicants get two weeks to finish their business plans.
3. **Selection of the business plan.** After receiving the business plans, the staff of Dinar Capital reviews the plans. Some plans are accepted without doubt, some field visits are done for the more doubtful business plans and some plans are rejected. Criteria that are used in this selection are:
   a. Does it look like the applicant has a **realistic image of the potential of its business**? The business plan will be compared with other business plans in the same sector/activity. A wrong estimation of the costs or revenues results in planning errors which may be fatal for the business.
   b. Is the applicant **member of a church** and does the pastor support him/her taking a loan? For Dinar Capital it is very important that the clients can be trusted. The incentive to repay properly is very high for members of the affiliated churches that have recommendation of a pastor, because they will lose reputation by not repaying the loan.
   c. Does the applicant **believe in his business** and that God will bless his business? Dinar Capital is a Christian MFI. Where a secular MFI would look at the vision, development and effort put in the business, Dinar Capital values the faith in the business. It is very important that a client has confidence in the business.
   d. How useful are the assets that the client will spend the money on? If the loan is not used optimal for the business, the *capacity to repay* may decrease.
   e. Will the business be the only source of income? In case of a start-up business, the business is not allowed to be the only source of income because there is a high risk to a low *capacity to repay*.
   f. Does the applicant have experience in the sector? Without experience, clients are usually rejected.
   g. What is the credit history of the applicant?
   h. Does the applicant have a computer? This is not a condition, but it indicates how administration and business planning will be organized. To each client not having a computer, it is strongly advised to buy one.

The interest rate is between 6-12%. The average loan size of their clients is $1517.85, so their average loan is smaller than the average Moldovan microloan.

These two MFIs are typical examples of NGOs active in the microfinance sector. Their conditions are not difficult to fulfil, training has an important role and the average loan size is quite small

(for Moldovan notions). Now, the set of hypotheses will be expanded and specified according to the following guidelines:
- If a factor is mentioned more specifically or with another accent in the case studies, the hypothesis will be reformed to the Moldovan context. (table 3.5)
- If a factor is not mentioned in these case studies, but is mentioned in a hypothesis from the previous chapter, the hypothesis will still be taken into account. (table 3.5)
- If a factor was not mentioned until the case studies, it will be added.

Table 3.5 displays a comparison of the hypotheses formed in chapter two and the factors mentioned in the case studies.

Table 3.5 *Hypothesis about*	*Invest Credit*	*Dinar Capital*	*Change in hypothesis?*
Gender	No	No	No
Health	Yes	No	Yes, hypothesis changes to: *A client with a good lifestyle and a good health is more successful in repaying than a client with a worse lifestyle*
Poverty	No	No	No
Social capital	Yes, via neighbourhood	Yes, via church networks	No
Credit history	Yes	Yes	No
Ownership of assets	Yes	Yes, but especially about what the client will invest the loan in	No
Specialization	No	No	No
More sources of income	No	Yes	No
Modern and innovative	Yes, via age	No	No

New hypotheses:

Hypothesis 17: Clients with knowledge about contracts are more successful in repaying than clients without that knowledge

Hypothesis 18: Clients with a spouse (and children) are more successful in repaying than clients without a spouse and children

Hypothesis 19: Clients of 45 years and older are less successful in repaying than clients younger than 45 years

Hypothesis 20: Clients that take little risk are more successful in repaying than clients that take much risk

Hypothesis 21: A business with a proper and realistic planning in advance is more successful in repaying than a business without a (good and realistic) plan in advance

Hypothesis 22: A client that has confidence/faith/vision for his business is more successful in repaying than a business with a lack of confidence/faith/vision

Hypothesis 23: If the loan amount is invested in a useful asset the client is more successful in repaying the loan than a client that invested in a less useful asset

Hypothesis 24: A client that has experience in the sector is more successful in repaying than a client without experience in the sector

Hypothesis 25: A client with a computer is more successful in repaying than a client without computer

2.2.3 ILLUSTRATION OF HYPOTHESES AFTER CONSIDERING THE MOLDOVAN CONTEXT
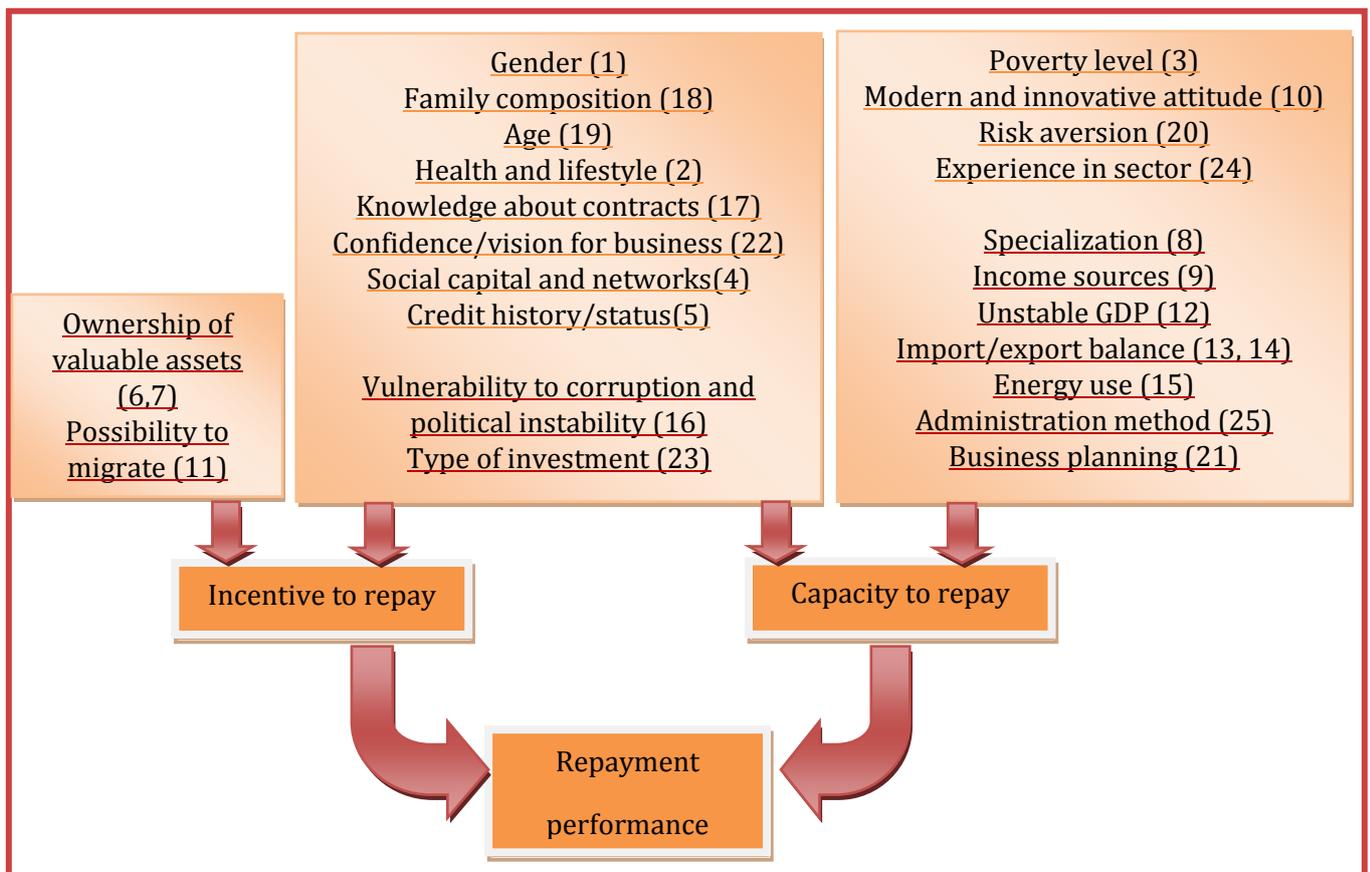
Chart 2: Illustration of hypotheses

The set of hypotheses formed in this and last chapter are illustrated in chart 2. Again the number in brackets behind the factors refer to the hypothesis. The factors that are predicted to influence the repayment performance are again divided personal factors (orange underlined) and activity-related factors (red underlined). The region-related factors are also in the chart, but within the region Moldova, the region-related factors are personal- or activity-related factors. This set of hypotheses will be tested with Moldovan empirics in the next three chapters.

PART B: TESTS

3. DATA

3.1 DESCRIPTION OF DATA

To test the hypotheses formed in part A, I got access to the administration system of Dinar Capital and I was able to do seven in-depth interviews with lenders of Dinar Capital. Those two sources are the empirical data which will be used to test the set of hypotheses formed in part A.

3.1.1 Quantitative data from the administration

The administration of Dinar Capital consisted of several separate Excel documents, Word documents and paperwork. Because the former employee used Russian as well as Romanian to administrate, many clients were registered twice, sometimes with different loan products. Moreover there were no rules or requirements concerning minimum knowledge about a client. Therefore, variables like marital status are available for only a small part of the lenders group. It was confusing to form good dataset based on the administration. After excluding as much as possible mistakes and after correcting for double or missing observations, four datasets were formed:

Dataset A   Dependent variable is repayment performance. The source is several administration parts of Dinar Capital from before the 20th of March. (n=114)

Dataset B   Dependent variable is business success. The source is several administration parts of Dinar Capital from before the 20th of March. (n=151)

Dataset C   A collection of failure reasons. The source is another branch of the administration of Dinar Capital from before the 20th of March. (n=142)

Dataset D   The administration of Dinar Capital from 20 March 2012. This dataset is collected in Microsoft Access. Queries are used to make subgroups relevant for the analyses. (n=219)

All these datasets have own advantages and disadvantages. In each dataset much data is missing. Therefore, in the analyses the number of observations (n) will differ often. The specific characteristics of the datasets are in Appendix 1.

3.2.2 Qualitative data from the in-depth interviews

Besides these datasets, qualitative information is gained in seven in-depth interviews with clients of Dinar Capital. The initial role of the in-depth interviews was to look beyond figures to see the reasons behind the findings resulting from the quantitative data anlysis. However, quite a lot hypotheses are not testable with the quantitative data, so the interviews were there both to collect positivistic and emotional data: they became semi-structured interviews (Silverman, 2006).

The sample is done in a purposive way, to cover for the variety in gender, age, sector, activities and family composition (table 3.1). Unfortunately is was socially unacceptable and impossible to do in-depth interviews with bad clients. Although the selected clients sometimes have problems, they are not bad performers. When I asked about the effect of their problems on their future repayment, they told me they would do their very best to repay on time. Therefore, success or failure factors for repayment performance via the *incentive to pay* are not answerable in this way. But for the success or failure factors that influence repayment performance via the

capacity to repay, the information from these interviews is a valuable source of information because it represents the experiences of the clients themselves.

The 7 clients that are selected, are:

Table 3.1 Name	Gender	Age	Sector	Activity	Lives with
Malic Nicolai	male	44	Services (rural)	Offers tractor services	Wife, 2 children
Scutelnic Andrei	male	21	Agricultural (rural)	Grows grains and vegetables	parents, 4 siblings
Scolnic Alexei	male	30	Manufacturing (urban)	Carpenter	Parents, wife, 2 children
Iacob Ina	female	34	Services (urban)	Hotel holder	Husband, 1 child
Ciobanu Michael	male	32	Agriculture (rural)	Greenhouse with vegetables	Wife, 2 children
Larisa Marcinscaia	female	45	Commerce (urban)	Storing in tailoring material	Husband, 2 children, sister
Dobinda Andrei	male	37	Agriculture (rural)	Grows sheep, produces cheese and other milk-products	Wife, 4 children, 1 old man (adopted, he helps in business)

I made some questions as a guideline for the interview. I discussed the interview design with a Vazdautan (2012) in order to make them understandable and relevant for the clients. The interviews are held in Romanian by three different staffmembers of Dinar Capital: Tcaci, Vazdautan and Plamadeala. During the interviews, they translated the answers of the respondents in English. I sometimes added extra questions during the interviews. Moldovans were quite open about their situation and some of the respondents answered very enthousiasticly. During the interviews the staff made notes and afterwards we discussed the answers that the respondent gave in English. By doing so, the staff also seemed to be valuable sources of information.

After all interviews were held, I coded the data with different themes. I tried to order the themes according to the initial set of hypotheses. After coding the data, it is abstracted in general findings which will be described in chapter 4 and 5. (Spiggle, 1994) Whether these respondents can be seen as a good representation to answer our main question, can be questioned. We have to keep in mind the absence-of-bad-client-bias.

3.2 METHODS OF ANALYSIS

3.2.1 Model testing

The initial idea was to test the hypotheses in one model by running a regression on the quantitative data from the administration of Dinar Capital. Unfortunately, for many hypotheses no data was available in the administration. Using the available data, no significant models can be found. The failure of these models can be found in the poorness of the datasets. Several negative aspects of the dataset are:

- Some variables have little variety. There are, for example, only 5 clients of who it is known that they are not married.

- There are many missing data points, especially on proxies for business- and sectoral experience and family composition.
- Dependencies between the explanatory (dummy) variables required to drop some explanatory variables.

Section 4.1 shortly describes these attempts to test models. Because the initial plan failed, new ways had to be found to continue testing hypotheses.

3.2.2 Grouping the hypotheses

When comparing the set of hypotheses with the data available in the administration of Dinar Capital, the hypotheses can be ordered in three groups.

- Hypotheses testable with quantitative data and explicable with qualitative data
- Hypotheses (roughly) testable and explicable with qualitative data
- Hypotheses not testable for the empirical case Dinar Capital

Table 3.2	Hypotheses
Testable with quantitative data	1, 8, 12, 18, 19, 21, 24, 25
'Testable' with qualitative data	2, 4, 5, 9, 10, 11, 15, 16, 22
Not testable	3, 6, 7, 13, 14, 17, 20, 23

The hypotheses of the first two groups will be assumed or rejected in the analysis. The not-testable hypotheses are not necessarily untrue for Moldovan micro lenders, but the explanatory variable in the hypothesis is not observable for clients of Dinar Capital. At least not in the two months of field visits that were available for this research. Table 3.3 shortly explains why it is impossible to test the not-testable hypotheses.

Table 3.3 Hypothesis	Theme	Reason
3	Poverty levels	Information about the poverty level is not registered and impossible to get in interviews
6, 7 & 23	Ownership of and investment in valuable assets	Dinar Capital does not require collateral for start-up loans
13 & 14	Role of international trade	Clients of Dinar Capital do not export or import products
17	Knowledge about contracts	Each client has the minimal required knowledge of contracts, because they all had a business course
20	Risk	Differences in risk attitudes could not be observed: all clients were very risk-averse

3.2.3 Analyses of the testable hypotheses

After removing the not-testable hypotheses, two kinds of hypotheses are left. The first group of hypotheses will be tested in chapter 4. The second group of hypotheses will be tested in chapter 5. In chapter 4, both quantitative and qualitative data is used to reject or to assume the hypotheses. (see table 3.4) For each hypothesis, first the quantitative data will be analysed by calculating means, percentages and testing crosstabs. After that analysis, the explanation of these results will be gained from the qualitative information from the in-depth interviews. In chapter 5, only the qualitative data from the in-depth interviews is used to reject or to assume

the hypotheses. After chapter 4 and 5, the conclusion will display the chart of not-rejected hypotheses.

Table 3.4	Quantitative data (administration)	Qualitative data (interviews)
Testable with quantitative data	X	X
'Testable' with qualitative data	-	X
Not testable	-	-

4. TESTABLE HYPOTHESES: QUANTITATIVE & QUALITATIVE

4.1 MODEL TESTS

Having datasets A, B, C and D it would be ideal to test the factors that influence repayment success within a model. Within a model the effect of different factors can be tested; controlled for other explanatory variables. However, as already described in chapter 3, none of the tested models gave significant results. In this section, the regressions will shortly be described.

Of the four datasets, two are used in these models: dataset A with repayment performance as dependent variable (N=114) and dataset B with business success as dependent variable (N=91). The characteristics of both datasets are in appendix 1.

4.1.1 First two analyses (repayment performance as dependent variable)

The first analysis tested the model in which the repayment performance is the dependent variable. Explanatory variables are personal factors, business activity and entrepreneurial attitude/skills, as based on the chart of chapter 1 and 2. There are two indicators of repayment performance. The first indicator is the arrears rate (that is the amount due divided by the amount outstanding). With this indicator as dependent variable, an OLS did not result in a rejection of the null hypothesis (appendix 2.1). The second indicator is a dummy variable for bad client. A client is defined bad if he has an amount due. A Probit analysis on that indicator also did not result in a significant model (appendix 2.2).

4.1.2 Third analysis (business performance as dependent variable)

In the third analysis, business success is the dependent variable. Of each client, Tcaci et al. (2012a) indicated how the business is performing. They rate 0 if the business is going well, 1 if it has some problems, 2 if the business is in big problems and 3 if the business failed. The advantage of this dependent variable is that the influence of factors on business success can be measured more directly. In the previous analyses the independent variables that are predicted to affect repayment performance via the *capacity to repay*, had an indirect effect on the dependent variable. In this analysis, the measured effect is the direct effect.

There is a significant positive correlation of .255 (sig: .014) between business success and the arrears rate. This is not a very high correlation, which indicates that clients with a failed business did repay the loan and that clients with a successful business defaulted strategically. The steps that are taken in the test of this model, are in appendix 3. Unfortunately, an Multinominal logit analysis did not result in an acceptable model.

4.1.3 Fourth analysis (loan design as explanatory variable)

The results of the first three analysis were all quite disappointing. Before gathering and ordering information per hypothesis, it is good to check whether the repayment performance does not mainly depend on something else: the period in which the client took the loan or the loan design. Through the years Dinar Capital changed rules and always made exceptions for special cases. Especially in the start of the project, almost each loan had different properties and conditions. This analysis used dataset A. After discovering that the repayment performance differs per time

period in which the clients took the loan, two options were tested (see appendix 5 for the complete analysis and output):

- First the option that the resources/clients ratio influenced repayment performance. In busy times (many new clients) the repayment performance seemed to be worse than in quit times. However, this correlation is not significant and very small.

- Then the second option is checked: whether the loan design influences the repayment performance. This analysis resulted in a significant model with one significant parameter: the length of the grace period. This is not a characteristic of the client or its region or activity, but of the conditions of the MFI itself. However, the length of the grace period only accounts for 0.061 of the variance (not controlled for other variables) so the hypothesis about personal, activity-related and regional factors are worth to be tested.

4.2 TESTING HYPOTHESES

The hypotheses testable with quantitative data, are numbers 1, 7, 8, 12, 18, 19, 21, 24, 25. They can be put in the three groups of factors used in the literature study:

	Hypotheses	Topics
Personal factors	1, 18, 19, 24	Gender, family composition, age, experience
Activity-related factors	8, 12	Sector, specialization
Regional factors	21, 25	Planning, computer

For these factors, the effect on *business success* and *repayment success* will be measured. All four datasets will be used. Contrary to the literature part, this section will start with the activity-related factors. The reason for this is that some hypotheses are only true for a specific sector. We start with activity-related factors, but within some of the personal and regional factors, the sector will also be taken into account.

4.2.1 Activity-related factors

4.2.1.1 SECTOR

In the set of testable hypotheses, there is one hypothesis on a sector-related issue: hypothesis 12.

Hypothesis 12: Clients working in the services sector have a worse repayment performance because of GDP instability compared to clients working in other sectors

Because this hypothesis is quite specific, we will look more general at the influence of the sector on the *business success*, especially at the interaction between the sector and the other factors. Factors that are very positive for one sector can be irrelevant for another sector. In this section we will compare *business and repayment success* per sector, but in some following sections in this chapter, differences per sector will also shortly be taken into account.

Table 4.1 shows the average business performance per sector from dataset B. There we see that, on average, the services sector has the highest *business success*, quickly followed by the agricultural sector. However, the high standard deviations show that it is not possible to distinguish one or two successful sectors above (an)other sector(s). Another way to look at sectoral differences, is to compare clients from a rural area with clients from an urban area. The results of this analysis are in table 4.2, but there is only a slightly difference between their mean

business success, again with a high standard deviation. Concluding, there will be no hypotheses specific about one sector, but some hypotheses will be the case for one of two specific sectors.

Table 4.1 Sector	n	Average business performance scale 0(good)-3(failed) (st dev.)	Median	Mode
Agriculture	89	1.30 (1.27)	1	0
Services	21	1.29 (1.31)	1	0
Manufacturing	25	1.48 (1.26)	1	0 and 3
Commerce	10	1.70 (1.42)	2	0

Table 4.2 Area	n	Average business performance	Median	Mode
Urban	33	1.27 (1.33)	1	0
Rural	118	1.34 (1.26)	1	0

Can a sector-related difference in *repayment performance* be distinguished? In table 4.3 the crosstab of badclient and sector is displayed. The Pearsons Chi-Square of this cross tabulation is 9.651 (sig. 0.022) which is significant at the α=0.05 level. There is a significant difference in repayment performance among the different sectors. The manufacturing sector performs worse than the other sectors.

Badclient * Sector Crosstabulation

Table 4.3		Sector				Total
		Agriculture	Services	Manufacturing	Commerce	
Badclient	.00	118	22	16	10	166
	1.00	24	5	12	3	44
Total		142	27	28	13	210
Percentage of total		16.9%	18.5%	42.9%	23.1%	21.0%

The conclusion of this test is that there is a difference in repayment performance among sectors, but not as predicted in hypothesis 12. In the services sector clients do not have a comparative disadvantage because of GDP instability. Therefore, hypothesis 12 is rejected.

In the in-depth interviews I also discussed GDP instability with the respondents. All respondents reacted negatively. They do not believe the annual figures that the government calculates, 'it is just for the people with power, it does not have an effect on my business'. On the question whether their client group fluctuated or decreased last years, the two respondents active in the services sector responded that the market for their services does not change. People need their services, it is difficult to cut in it. The other respondents also did not see the fluctuation of the GDP as cause for a market fluctuation in their branch.

SPECIALIZATION

Hypothesis 8: A client with a specialized activity is more successful in repaying than a client without specialization (provided that there is a market for its product/service)

When looking at the description of business activities, some activities are done by many clients and others are more rare. To test this hypothesis, we assume that a business with a 'rare' activity

is a specialized business. All clients from dataset D of which the activity-description is known are split up in clients with a 'rare' activity and clients with a 'frequent' activity. A 'rare' activity is defined as an activity that is practiced by maximal 2 of the clients of who the loan period is over (n=132). There are 30 'rare' activities, practiced by 36 clients and 14 'frequent' activities, practiced by 95 clients. In Appendix 4 there is an oversight of the kind of activities and their grouping.

Badclient * specialized activity Crosstabulation

Table 4.4	Specialized activity		
	.00	1.00	Total
bad .00	64	22	86
1.00	31	14	45
Total	95	36	131

Is there a difference between the repayment performance of specialized clients and non-specialized clients? In table 4.4 the crosstab of badclient and specialized activity is displayed. The Pearsons Chi-Square of this cross tabulation is .453 (sig. 0.501) which is not significant at the α=0.05 level. There is no significant difference in repayment performance between specialized and non-specialized clients. When testing such a crosstabulation for each sector separately, there is also no significant performance difference between specialized- and non-specialized businessmen.

In the in-depth interviews, there are two respondents of which the business success is positively influenced by specialisation, because their specialized products/services means absence of competition. Those are the tailor-shop and the hotel business. Where the other clients, especially in rural areas, do sometimes not have enough clients, these two respondents do not have worries about that. However, hypothesis 8 is rejected based on the quantitative results.

4.2.2 Personal factors

4.2.2.1 GENDER

Hypothesis 1: A female client is more successful than a male client

Is there a difference between the *business success* of women and men? In table 4.5 the crosstab of gender * business success in dataset B is displayed. The Pearsons Chi-Square of this cross tabulation is just not significant at the α=0.05 level: 7.383 (sig. 0.061). So there is no prove for a significant difference in business success of men and women. If α=0.1, gender would have a significant impact, but it would prove the opposite of the hypothesis, that male clients are more successful than female clients.

Performance * gender Crosstabulation

Table 4.5	Gender		
	female	male	Total
performance 0	2	55	57
1	1	35	36
2	0	10	10
3	7	41	48
Total	10	141	151

Is there a difference between the *repayment performance* of women and men? In table 4.6 the crosstab of gender and badclient in dataset A is displayed. The Pearsons Chi-Square of this cross tabulation is .603 (sig. 0.437) which is not significant at the α=0.05 level. There is no significant difference in repayment performance of men and women.

Gender * badclient Crosstabulation

Table 4.6		badclient		Total
		.00	1.00	
gender	.00	17	11	28
	1.00	78	36	114
Total		95	47	142

What is the reason for this difference between the Moldovan microfinance sector and the pattern which is seen in other microfinance sectors all over the world? Are Moldovan female clients more vulnerable to a specific kind of failure factor? In table 4.7, the division of failure factors from dataset C are displayed. There is no remarkable difference in the distribution of failure reasons within both gender groups, except for 2 women that migrated.

Table 4.7 N=142	Men (n=114)	Percentage	Women (n=28)	Percentage
Failed	43	37.7%	16	57.1%
Failure reasons	Attitude: 12 Sector: 7 Economy: 7 Health: 2 Migration: 1 Unknown:14	27.9% 16.3% 16.3% 4.7% 2.3% 32.6%	Attitude: 4 Sector: 2 Economy: 2 Health:2 Migration:2 Unknown: 4	25.0% 12.5% 12.5% 12.5% 12.5% 25.0%
Bad clients	36	31.6%	11	39.3%

The respondents were asked to express the usefulness of their gender for doing their business, in selling their goods, and in maintaining business contacts. The male respondents acutally all answered the same way: in their activity, men are more able to do business than women, women are equally able to sell their goods and women are less able to make and to maintain business contacts. Of the female respondents, the hotel runner answered that men are a bit more able to do business and the women of the tailor shop told that only women are able to do her kind of business, to sell goods and to maintain contacts. Concluding, the respondents are, compared to other countries, quite much sticked in gender roles, except for the tailor-shop client. This also causes a strong underrepresentation of female clients in the Moldovan microfinance sector. Of the registered Moldovan clients, only 33.9% is female, which is very low compared to other counties (MIX market, 2012 a). Probably because of this male domination, Moldovan women are not able to develop and use the qualities they have. Therefore they do not perform better than men. Therefore, hypothesis 1 is rejected.

4.2.2.2 FAMILY COMPOSITION

Hypothesis 18: Clients with a spouse (and children) are more successful in repaying than clients without a spouse and children

Information about the family composition is only available in dataset B, so the effect of family on *repayment performance* is not measurable, but the indirect effect on repayment performance via *business success,* is. In dataset B are 69 clients with a known marital status. Of them, 3 are not married and 66 are married. Although of the 3 non-married clients not one is very successful, the Pearsons Chi-Square of this cross tabulation (table 4.8) is not significant (sig. 0.267, α=0.05).

Performance * married Crosstabulation

Table 4.8		Married		
		0	1	Total
performance	0	0	32	32
	1	2	17	19
	2	0	6	6
	3	1	11	12
Total		3	66	69

Of 30 clients in the dataset it is known how many children they have. Table 4.9 displays the cross tabulation between business success and the amount of children. The Pearsons Chi-Square of this cross tabulation is not significant (sig. 0.700, $\alpha=0.05$).

Performance * children Crosstabulation

Table 4.9		Children									Total
		0	1	2	3	4	5	7	8	13	
performance	0	0	2	3	5	1	1	0	0	1	13
	1	2	1	2	1	0	0	1	0	0	7
	2	0	0	2	0	0	0	0	0	0	2
	3	1	0	3	2	0	1	0	1	0	8
Total		3	3	10	8	1	2	1	1	1	30

The reason for rejection of this hypothesis may be that there is indeed no influence, or that the n is not large enough, at least not the variance within the observations. Therefore, I discussed the topic family composition with the seven respondents of the interviews. All the respondents that are married (6 respondents), told me that their spouses support them in doing their business. What the exact role of the spouse is, differs. The husband of the tailor-shop women has a business in cars, so he does not have time to be involved in her activities. In contrary, the wife of Ciobanu Michael helps him in his greenhouse. About the role of children, the opinions differ. Three respondents let their children work in the business, the other three not, because they are too young. Child labour is not uncommon in Moldova, so in that sense, children can have a good contribution to the business. However, two of the three respondents with young children consider their children as useful, because they give an incentive to work hard in order to make sure they can take care of them.

The families in Moldova are often not formed by the spouse and the children only. Tree of the respondents have other people in their house. For one respondent, Dobinda Andrei, this is a useful contribution to his business, because the man works for food and shelter.

Concluding, according to the respondents, family composition is not unimportant in business success. More family members are useful in two ways: via extra workpower and via stability/incentive to work hard. Therefore, the hypothesis will not be rejected, although the quantitative data is not significant.

4.2.2.3 AGE

Hypothesis 19: Clients of 45 years and older are less successful in repaying than clients younger than 45 years

The cross tabulation between *business success* and 'old' (which is >45 years) is displayed in table 4.10. The Pearsons Chi-Square of this cross tabulation is not significant (sig. 0.509, $\alpha=0.05$).

Performance * Old Crosstabulation

Table 4.10		Old		Total
		.00	1.00	
performance	0	38	19	57
	1	23	12	35
	2	7	3	10
	3	37	10	47
Total		105	44	149

However, this does not necessary mean that there is no effect of age on business success. Therefore, we do not take two age groups, but we calculate the average age of the clients per score on *business success*. These mean ages are displayed in table 4.11. The mean ages do not differ very much and the standard deviations are large, but when calculating it for separate sectors, in the manufacturing sector a trend is observable. There, businesses of old clients fail and that younger clients have a successful business. A reason for this can be that younger clients are more used to produce goods in a capitalistic economy, in contrast to older clients that still work with the Soviet attitude and methods.

Table 4.11 Business success	N	Average age in years(st dev.)	Median	Manufacturing mean (st dev.)
<1	47	39.9 (10.0)	39	37.6 (6.75)
≥1 and <2	28	39.7 (8.8)	40.5	39.3 (7.18)
≥2 and <3	7	40.6 (9.5)	39	39.7 (10.41)
3	35	38.7 (9.6)	37	45.7 (11.84)

To see the effect of age on *repayment performance*, the average age of bad clients is calculated (data from dataset A). In table 4.12 these means are displayed. Besides a negative influence on *business success*, age also negatively affects the *repayment performance* in the manufacturing sector. In general, the average age of bad clients is somewhat lower, but the standard deviations are too high to conclude something about that. For now we change hypothesis 19 in the new statement: *In the manufacturing sector, younger clients are more successful than elder clients.*

Table 4.12	Average age general			Average age manufacturing sector			
badclient	Mean	N	Std. dev.	badclient	Mean	N	Std. dev.
.00	38.3579	95	9.20790	.00	35.3000	10	5.59861
1.00	36.7895	19	7.59809	1.00	39.3333	3	5.50757
Total	38.0965	114	8.94820	Total	36.2308	13	5.62959

4.2.2.4 EXPERIENCE

Hypothesis 24: A client that has experience in the sector is more successful in repaying than a client without experience in the sector

Dataset A contains a variable for 'experience in entrepreneurship' and 'experience in the field' for 24 clients. 'Experience' is defined as whether the client himself considers he has experience: it was one question on the application form. The 'evidence' they give for being experienced workers, differ, so I valued the well-motivated experiences with 2, the not-motivated or weakly motivated experiences with 1 and the people without experience 0.

In table 4.12 we see that experience in business is not a success factor for this group of clients, 9 of the 14 clients without experience have a successful business, in contrary to only 2 of the group of clients with experience. This difference is rejected by the Pearsons Chi-Square statistics: 9.588 (sig.143 with α=0.05). The effect of experience in the sector/field seems to be a positive factor: of the clients without experience in the sector no one has a very good business.

The Pearsons Chi-Square of that cross-tabulation is 11.364 (sig. 0.078) which means rejection with α=0.05, but no rejection with α=0.1.

Table 4.12		Experiencebusiness			Experiencesector			Total
		.00	1.00	2.00	.00	1.00	2.00	
performance	.00	9	1	1	0	6	6	12
	1.00	1	1	2	1	0	3	4
	2.00	2	0	0	1	1	0	2
	3.00	2	3	1	0	4	2	6
Total		14	5	4	2	11	11	24

Unfortunately the direct effect of experience on repayment performance is not possible to test, because datasets A and D do not cover these figures on experience.

We found that 'experience in the sector' is a positive factor for business success, but 'experience in doing business' not. Of the seven respondents, five already had experience in the field before they took the loan. What do they think about experience? All five respondents told me that they would not have started the business without experience. The experience made them able to write a good business plan, to use good methods (which were also practiced at their former boss) and to assess the market. The two respondents that did not have experience, are the woman of the tailor-shop and the man that grows sheep. The first started her business because she saw there was not much competition. Actually, of the seven respondents, she has the best business, especially because there is not much competition. The lack of experience in the start of the business was not really negative for the business success in her case. The sheep farmer also did not face difficulties because he did not have experience. However, the importance that the other respondents attach to experience in the field and the quantitative results causes us not to reject hypothesis 24. A client that has experience in the sector is more successful in repaying than a client without experience in the sector. This via the *capacity to repay*. Because the amount of observations is quite small, it is not useful to analyse the effect of experience per sector.

4.2.3 Regional factors

4.2.3.1 PLANNING

Hypothesis 21: A business with a proper and realistic planning in advance is more successful in repaying than a business without a (good and realistic) plan in advance

A proxy for business planning/attitude can be found in the business plan, the care the client put in it, the content and the completeness of the plan. I reviewed 81 business plans on that aspects and give them a rating of the scale 1-5. 5 means a proper, realistic and complete business plan, 1 means an incomplete, sloppy business plan. In this section we compare the mean quality of the business plan with *business success* and *repayment performance.* In table 4.13 and 4.14 the cross tabulations are displayed. For both the Pearsons Chi-Square test results in a non-significant effect. (with α=0.05)

Business performance * completeness Crosstabulation

Table 4.13	completeness									
	1	1.5	2	2.5	3	3.5	4	4.5	5	Total
performance 0	1	0	2	2	2	6	13	13	3	42
1	0	1	0	1	5	4	6	4	0	21
2	0	0	0	0	0	0	3	2	0	5
3	1	0	2	2	1	0	4	3	0	13
Total	2	1	4	5	8	10	26	22	3	81

Badclient * completeness Crosstabulation

Table 4.14	1=uncomplete, 5=complete									
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	Total
badclient .00	2	1	4	4	8	10	25	25	4	83
1.00	0	0	0	2	1	0	7	2	0	12
Total	2	1	4	6	9	10	32	27	4	95

Concluding, this information tells us that the quality of the business plan does not increase business success. However, another point of view, dataset C, shows other results. Of the 42 clients of which the failure reason is known, 17 failed because of their business attitude. The category 'attitude' is formed by the failure reason descriptions in table 4.15.

Table 4.15 Failure description admin	English	# failures	# bad clients
Planificarea incorecta	Incorrect planning	11	5
Lipsa de cunaștința	Lack of knowledge	4	2
A refuzat de a face bisnes	Refused to do business	1	0
Nu a rezistat concurenței	Was not able to resist competition	1	0

A failing attitude is a reason which is easy to mention after failure, but it is difficult to select clients on a good attitude *ex ante*. In table 4.15 we see that about half of the failed businesses are bad clients, so incorrect planning affects the *repayment performance.*

Is the cause of this contradictory result the quality of the business plan? The business plan that has to be handed in covers a description of some important aspects: product, marketing strategy, primitive calculation of costs, predicted revenues and a SWOT analysis. I discussed it with the seven respondents in the in-depth interviews. The farmers just wrote down some descriptions and figures and continued farming as they did, but now with a new investment and a repayment burden. They deviated from their planning of crop species and quantities because it is very hard to do a good planning in a small agricultural business and they are not used to plan. The respondents from the urban area are much more precise and stick more to their business plan. Of these respondents, no one has repayment problems because of a lack of planning. However, we do not reject this hypothesis, because the goodness of the proxy is discussable and the data in dataset C is convincing.

4.2.3.2 COMPUTER

Hypothesis 25: A client with a computer is more successful in repaying than a client without computer.

This is hypothesized based on the expectation of one of the agricultural advisors of Dinar Capital. With a computer, clients have more connections, are more able to plan their business and to

have a proper administration. We will test this hypothesis by using the dummy whether the business plan is handwritten. A handwritten business plan means almost certainly that the client does not have a computer. This variable is within datasets A and B identified for 80 and 93 clients.

Business performance * handwritten Crosstabulation

Table 4.16		handwritten		Total
		0	1	
performance	0	21	21	42
	1	7	14	21
	2	1	4	5
	3	4	8	12
Total		33	47	80

Badclient * handwritten Crosstabulation

Table 4.17		handwritten		Total
		0	1	
badclient	.00	31	50	81
	1.00	6	6	12
Total		37	56	93

The Pearsons Chi-Square is for both cross tabulations not significant. (sig. is respectively .375 and .493, so rejected with α=0.05).

The use of a computer in administration is also discussed with the respondents. The respondents all spend 0 till 2 hours a week on administration, except for the tailor-shop client who spends 10-12 hours on administration. She and the hotel business client have a computer. The other respondents do their administration manually in a notebook. The clients with a computer administrate every cost and revenue, the others do it approximately. On the question whether a computer is useful for the administration, they all strongly agree. On the question whether their business would be more successful if they would have more administration skills, they also agree. This opinion towards a computer is positive, because a field visit in the south of Moldova showed me that clients were afraid of computers because the devil may work through it. This shows that the respondents are all quite modern. However, we did not find prove to assume hypothesis 25, so it will be rejected.

5. 'TESTABLE' HYPOTHESES (QUALITATIVE)

The hypotheses that will be rejected or assumed based on the qualitative data, are numbers 2, 4, 5, 9, 10, 11, 15, 16, 22. They can be put in the three groups of factors used in the literature study:

	Hypotheses	Topics
Personal factors	2, 5, 10, 22	Health/lifestyle, credit status, modernity, confidence/faith/vision
Activity-related factors	9, 15	Income sources, energy use
Regional factors	4, 11, 16	Social capital, migration, corruption

The two sources used in this chapter are dataset C and the in-depth interviews. The hypotheses are not testable with data, but a general impression about their trueness can be given based on the qualitative data.

5.1 PERSONAL FACTORS

5.1.1 Health and lifestyle

Hypothesis 2: A client with a good lifestyle and a good health is more successful in repaying than a client with a worse health and lifestyle

Of all failed clients in dataset C, 4 failed because they had problems with their health. Before a client gets a loan of Dinar Capital, there is a strong selection in which the local pastor has a large role. Because being member of a church implicates a lifestyle without alcohol, multiple (sexual) partners and smoking, we may assume that the lifestyle of Dinar clients is quite healthy, compared with the average Moldovan client. The cases of failed businesses because of health are shortly illustrated in table 5.1. We see that in three of the four cases, the failure (caused by health problems) results in due payments.

Table 5.1 Client	Business activity	Failure reason as described in admin	Bad client?
Moroi Marcel	Production of pigs	A murit (is died)	Yes
Ladnaja Liubovi	She offers building and construction services	Probleme de sanatate (health problems)	Yes
Atoman Mihail	Different construction projects in rural area	Sanatate (health)	No
Lungu Elena	Sells different small items in rural area	Planificarea incorectă, problema cu sanatate (incorrect planning and problems with health)	Yes

To what extent do clients stop their business or stop repaying if they have problems with health and lifestyle? Of the respondents of the in-depth interviews, one had problems with his health: Ciobanu Michael. He broke his hand a year ago, and he still has problems with doing heavy work. The problem with his hand forced him to change his production: he produced less vegetables and his wife helped him with yielding. For the rest, his business is doing good, so he does not have problems in repaying his loan. If his health problems would be very severe, it would only affect his repayment performance via the *capacity to repay*, not via the *incentive to repay*, because religion does require courage and perseverance, especially in times of (health) problems. Therefore hypothesis 2 will not be rejected, but it will move to the part that only affect the *capacity to repay*.

5.1.2 Credit status/history

Hypothesis 5: A client with a provable positive credit history/status is more successful in repaying than a client without a provable good credit history/status

In dataset C, there is no notion of failure because of overdebtness. Two of the respondents of the in-depth interviews took another loan before the loan of Dinar Capital: the sheep farmer and the man who offers tractor services. The sheep farmer did not have repayment problems, although he still had to finish the payments for the first loan. His revenue was enough to repay both loans. However, the tractor-services respondent, had cash flow problems because he has more loans with a group of 10 farmers in his village. For a few years they have to repay much, and it is very hard to gain enough money to repay all three loans properly. They do not have due payments yet, but it will be hard to prevent them in the near future. In this we see that credit history can indeed be a cause for a bad repayment performance, so we do not reject hypothesis 5.

5.1.3 Modern and innovative attitude

Hypothesis 10: Clients with modern and innovative businesses are more able to repay than old-fashioned and traditional clients

In the cases of these seven respondents, it is not very difficult to filter out the 'modern' clients. This does not depend on age, but on the area people live in. Especially the clients not working in agriculture, are flexible. The carpenter, for example had a serious lack of clients, but then he decided to make promotion in a new quarter in Chisinau. By doing that, he scored much more clients. He confessed to me that he did not stick to his business plan (which he had to write in order to get the loan), but that he reached the aim of the business plan by using other means. Otherwise he would not have gain enough income. A lack of insight in modern and innovative marketing techniques is also mentioned as a frequent failure reason for urban shops by Tcaci et al. (2012a). Different is the case in agriculture, where the farmers still use very traditional methods. Because 141 of the 219 registered clients in dataset D are active in the agricultural sector, the situation and developments in the Moldovan market for small agricultural businesses gets special attention in this section. In the in-depth interviews, two of the agricultural respondents told that they do not have any competition problems. Those are the sheep-business and the greenhouse. What supply choices did they make to avoid competition? Their answer is remarkable. They do not supply to an intermediary, there is no auction, they do never use (future) contracts, they just sell their food on the local or regional open air market. The time they spend on it, depends on their yield. After harvesting time, they sell each day, during the winter almost never. It is very remarkable that they have enough clients, because harvesting time is almost equal for all farmers in the village. One of the reasons they mentioned is their fixed client group in the village, for example from the same church. And rural Moldovans use food-processing techniques, so that also in the winter the food can be consumed. On the regional market, there are much more buyers that do not work in the agricultural sector, so there the supply market is larger. The two other agricultural respondents (in grains and tractor services) sell a part of their yield themselves and a part to intermediaries that sell the products on the regional open air market or the open air market in Chisinau. They face competition, but their production is larger. For their products, there is a missing market, because the supply mechanisms like auctions, future markets and (international) trade networks are not developed. Bratutel mentioned that only for very large mechanized (often foreign owned) farms, it is possible to join national or international trade and use mechanisms like future contracts. Clients of Dinar Capital do never reach that level, because their production is too small and their

products do not fulfil the requirements of the trade networks. Interesting is to see that the respondents do not want to strive for being member of a trade network, or to modernize. They all mention that selling products on the open air market is most profitable. As long as there are enough clients to do so, it is not problematic, but farms that want to expand, have troubles. Therefore, one of the aims of Dinar Capital, that clients generate jobs for the Moldovan society, is something which hardly appears in the agricultural sector. Consequently, a modern and innovative attitude is not necessary in the agricultural sector. Therefore, hypothesis 10 changes to:

> *In the urban areas, clients with modern and innovative businesses are more able to repay than old-fashioned and traditional clients*

5.1.4 Confidence/faith/vision

> *Hypothesis 22: A client that has confidence/faith/vision for his business is more successful in repaying than a business with a lack of confidence/faith/vision*

When analysing the in-depth interviews on the topic vision, it is remarkable that the respondents working in agriculture had less vision than the respondents working in the urban areas. Especially the woman of the tailor-shop and the carpenter were very enthusiastic and wanted to increase production, but the other respondents lived with the day. It is hard to say whether a lack of vision really causes worse repayments. It is plausible to say that the motivation to mention vision/faith as an important factor in case study 2, is caused by the Christian identity of Dinar Capital and not because of experience with bad clients with a lack of vision. Therefore, hypothesis 22 will be rejected.

5.2 ACTIVITY RELATED FACTORS

5.2.1 Income sources

> *Hypothesis 9: A client with more economic activities than his business is more successful than a client of which the business is his only source of income*

Only the carpenter does not have another economic activity besides his business. The other respondents all have another source of income. Of the female respondents, the husbands are working and the male respondents have an additional activity. The respondents working in agriculture have always something to do, which make them able to smooth their income and repayment requirements. The carpenter mentions that it is indeed stressful to be fully dependent on his business, especially in the beginning. But now, about 2 years later he has enough clients so there is no risk for him that he is not able to repay properly. However, it certainly is a factor which has to be taken into account for a start-up business according to the other respondents. Therefore we do not reject hypothesis 9.

5.2.2 Energy use

> *Hypothesis 15: Clients that are involved in an activity in which much energy is used have a worse repayment performance than clients that do not need energy in their business activity*

On the macro-economic topics GDP instability, inflation, corruption ed. the respondents reacted ignorant and negative. They see them as macro-figures, invented by people that have power but

not influential on their business. However, after explaining that higher energy prices was one of the effects, the agricultural respondents reacted. They were negatively affected by high energy prices, especially the respondent who offers tractor services. He tries to drive the tractor very efficiently, but it is very difficult to make small profits. For now it is not yet a threat to repayment, but if energy prices will increase, his *capacity to repay* may be too low. Therefore, this hypothesis will not be rejected.

5.3 REGIONAL FACTORS

5.3.1 Social capital

Hypothesis 4: Social capital, coming from membership of social networks, positively affects the repayment

Some hypotheses, for example 'collateral', could not be tested because Dinar Capital works a lot via social networks; especially the church. Therefore this section is quite important, although these seven respondents can only show us the positive aspects of social network on repayment performance, because all clients are good clients.
In Moldova, taking a loan is nothing to be ashamed, but it is also not a form of status. Of the seven respondents, only two do not discuss it with people other than their direct relatives, and the others openly discuss it with family and friends (more than 10 persons). Before taking a loan, the people that are involved in the decision are the spouse (5), brother (2), parents (1) and the pastor (1). Of the seven respondents, five know other clients of Dinar Capital. Often a group of clients from the same village forms a dense network. They know each other from church, travel together to the business course etc. The first two respondents are in a network of 10 clients in which they took group loans of other MFIs, exchange information about agricultural methods and share a car and a storage. Their network is very strong and would prevent all defaulted payments, except for the case if the whole group fails.
Of the five respondents that know other clients, one would ask church members to help him to repay if he would have repayment problems, three would maybe ask church members and one would go to work abroad. All respondents are sure that church/group members would help them if they are able to help. They also all would help another client from their network if he/she has repayment problems.
The two respondents without such a dense network, are the hotel-business client and the carpenter. The hotel-business owner is family of Vazdautan, so via that link she is also forced to repay the loan (assuming that the Vazdautan acts fairly). It is not that the carpenter has a bad repayment performance because he is not in a network of Dinar Capital clients, however he has less possibilities in coping with cash flow problems. Therefore, we do not reject hypothesis 4.

5.3.2 Migration

Hypothesis 11: Clients with possibilities and incentives to migrate have a worse repayment performance than clients without that possibilities and incentives

Of all failed businesses in dataset C, three clients stopped because they migrated; two businesses in vegetable growth and one in apiary. However, these clients all repaid their loan properly.
Each of the respondent in the in-depth interviews was also asked whether they once thought about migration. Four respondents answered 'no' immediately, one respondent said 'only if I'm bankrupt' and the other two would go if they had financial problems, but without wife and children and only for a short time. The respondent of 21 years old would go if he was not able to

repay the loan, but not to flee, but to make sure he earns enough money to repay the loan. So we see that the possibility to migrate does not decrease the incentive to repay, it even increases the capacity to repay in some cases. Therefore we reject hypothesis 11.

5.3.3 Corruption and political instability

> *Hypothesis 16: Clients that are affected by corruption and political instability have a worse repayment performance than clients that are not affected by it*

Two of the failed clients in dataset C have a failed business because they had problems with the local administration. One produces nuts in a city and the other brick stones in a rural area. They both did not repay their loan.

For the respondents, the terms corruption and political instability is really beyond their scope. Therefore, I changed the conversations into the subject 'complexity of juridical procedures'. Dinar Capital requires clients to be officially registered at the government, so requirements of local fiscal authorities can be a threat for them. Difficulties in this, differ per region. The first two respondents from the agricultural sector live in the north of Moldova and in their region the fiscal authorities always find a reason to ask for money. One respondent hired an intermediary to do the paper work, the other still faced problems with the local administrations. The requirements are complex and not understandable for the farmers. Sometimes they are a serious threat for their cash flows which may make them unable to fulfil the repayments. For the hotel-business requirements of fiscal authorities are better understandable and they keep in though with the people that make the decisions. Therefore it is less difficult and expensive for him to fulfil the requirements. The other respondents never faced public requirements except for the registration of their business. Therefore, hypothesis 16 is not rejected, but changes to:

> *Clients that are affected by complexity of public procedures have a worse repayment performance than clients that are not affected by it*

6. CONCLUSION AND DISCUSSION

6.1 RESULTS

This thesis covers an exploratory research to the success and failure factors of start-up businesses in Moldova. The main question used is: *What are factors that influence the success of start-up businesses in Moldova after receiving microcredit?* The factors were hypothesized in part A and tested, rejected or accepted in part B. Of the hypotheses, not one was accepted in a statistical model. In the subsequent analyses, the requirements for not rejecting a hypothesis are made weaker. To 'test' the last hypotheses (of which no quantitative data was available), single observations in the in-depth interviews are used to reject or to accept hypotheses. Unfortunately, many hypotheses seemed not testable in the case Dinar Capital, because there was, for example, no collateral requirement, there were no clients involved in international trade and there was no absence of knowledge about contracts, because it was a required course within the loan program. Those hypotheses must be tested in another Moldovan MFI in order to reject/accept them officially. Table 6.1 gives an overview of the hypotheses that are rejected and assumed. The grey marked hypotheses are slightly changed. The list of assumed hypotheses can be found on page 50. The factors that 'survived' the tests, are displayed in the final chart.

Table 6.1 Method	Rejected	Assumed
Testable *Quantitative and qualitative analysis*	1, 12, 8, 25	18, 19, 21, 24
'Testable' *Qualitative analysis*	11	2, 4, 5, 9, 10, 15, 16
Not testable *By lack of data*	3, 6, 7, 13, 14, 17, 20, 23	-
New statement	-	Grace period negatively affects repayment performance
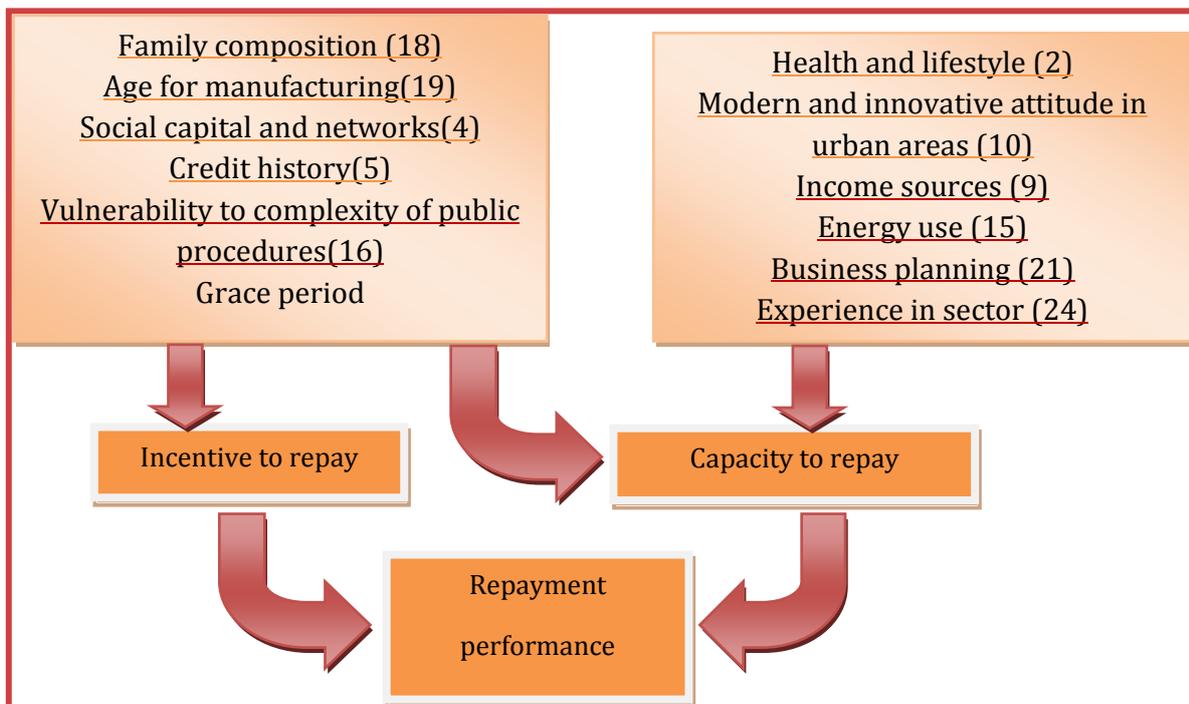
Final chart: Success and failure factors for start-up businesses that received a microloan

6.2 IMPLICATIONS OF THESE RESULTS

A successful client, is a client that repays the money properly. In the abstract economic approach used in a.o. Ray (1998) in which all the factors that influence the *capacity to repay* are covered in 'high-risk vs. low-risk' and all factors that influence the *incentive to repay* are covered in the variable 'outside option', the power of those factors is already taken into the number expressing that variables. Exploring failure or success factors, which is done in this thesis, is relatively easy, but determining the power of those factors is very complex. There is a *variety in the intensity* of the factors and *variety in the impact* of the factors on the individual clients. For client A one of the failure factors mentioned already causes due payments, but client B is still able to repay the loan, unless he is unhealthy, he doesn't have a computer, he uses much energy and he has troubles with the local government.

One of the factors mentioned, modern and innovative attitude, can be a key to the ability of clients to cope with failure factors, although we did not see the necessity of such a modern and innovative attitude in the rural areas. Maybe a more general and vague concept like 'the ability to cope with setbacks' would give more insight in the threat of failure factors for the repayment. Nevertheless, to measure such a vague concept is very difficult and only approachable in experimental research which was not possible here, given time and resources constraints.

Furthermore, the threat from the factors that affect the repayment via the *incentive to repay* are especially difficult to predict. Unfortunately I did not find empirics on clients that had the *capacity to repay* but did not pay by a lack of *incentive to repay.* One of the explanations for the absence of these empirics is the Christian identity of the case Dinar Capital. It was impossible for me to figure out whether such clients actually existed in the case, but it is not obvious given the strict lifestyle and the power of the church-networks. The relatively small correlation between business success and repayment performance showed that there is no 1 to 1 relation between them, but there were quite a lot cases in which the client stopped his business but still had the *capacity to repay* by other income sources. Mechanisms behind repayment choices and ways to deal with success and failure is an interesting area for further research. And moreover, to get a good insight in success and failure factors of the Moldovan microfinance clients, information from clients from other MFIs than Dinar Capital is necessary.

LISTS OF DATASETS, INFORMANTS AND HYPOTHESES

LIST OF DATASETS

General remark: the datasets have a certain overlap. I tried to exclude as much as possible mistakes and to correct for double or missing observations. In the analysis often the n will be less than mentioned here, because observations with missing data points are not taken into account.

Dataset A   Dependent variable is repayment performance. See also Appendix 1. The source is several administration parts of Dinar Capital from before the 20th of March. (n=114)

Dataset B   Dependent variable is business success. See also Appendix 1. The source is several administration parts of Dinar Capital from before the 20th of March. (n=151)

Dataset C   A collection of failure reasons. The source another branch of the administration of Dinar Capital from before the 20th of March. (n=142)

Dataset D   The administration of Dinar Capital from 20 March 2012. This dataset is collected in Microsoft Access. Queries are used to make subgroups relevant for the analyses. (n=219)

LIST OF INFORMANTS

Tcaci	Dinar Capital	Project leader
Vazdautan	Dinar Capital	Loan officer
Bratutel	Dinar Capital	Agricultural advisor
Plamadeala	Dinar Capital	Lawyer
Popa	Invest Credit	Chief loan officers

LIST OF HYPOTHESES

The hypotheses formed in part A (chart 2):

Hypothesis 1: A female client is more successful than a male client

Hypothesis 2: A client with a good lifestyle and a good health is more successful in repaying than a client with a worse lifestyle

Hypothesis 3: A less poor client is more successful than a very poor client

Hypothesis 4: Social capital, coming from membership of social networks, positively affects the repayment

Hypothesis 5: A client with a provable positive credit history/status is more successful in repaying than a client without a provable good credit history/status

Hypothesis 6: Ownership of valuable properties (in the eyes of client) positively affects the repayment

Hypothesis 7: A client working in the production sector (manufacturing) is more successful than a client working in the agriculture- or services sector because it has more collateral possibilities

Hypothesis 8: A client with a specialized activity is more successful than a client without specialization (provided that there is a market for its product/service)

Hypothesis 9: A client with more economic activities than his business is more successful than a client of which the business is his only source of income

Hypothesis 10: Clients with modern and innovative businesses are more able to repay than old-fashioned and traditional clients

Hypothesis 11: Clients with possibilities and incentives to migrate have a worse repayment performance than clients without that possibilities and incentives

Hypothesis 12: Clients working in the services sector have a worse repayment performance because of GDP instability compared to clients working in other sectors

Hypothesis 13: Clients that use imported products as input and/or do not sell their product to the world market have a worse repayment performance than clients that use domestic inputs and/or produce for the world market

Hypothesis 14: Clients who import and/or export goods for their businesses have a worse repayment performance than clients that buy and sell on the domestic market

Hypothesis 15: Clients that are involved in an activity in which much energy is used have a worse repayment performance than clients that do not need energy in their business activity

Hypothesis 16: Clients that are affected by corruption and political instability have a worse repayment performance than clients that are not affected by it

Hypothesis 17: Clients with knowledge about contracts are more successful in repaying than clients without that knowledge

Hypothesis 18: Clients with a spouse (and children) are more successful in repaying than clients without a spouse and children

Hypothesis 19: Clients of 45 years and older are less successful in repaying than clients younger than 45 years

Hypothesis 20: Clients that take little risk are more successful in repaying than clients that take much risk

Hypothesis 21: A business with a proper and realistic planning in advance is more successful in repaying than a business without a (good and realistic) plan in advance

Hypothesis 22: A client that has confidence/faith/vision for his business is more successful in repaying than a business with a lack of confidence/faith/vision

Hypothesis 23: If the loan amount is invested in a useful asset the client is more successful in repaying the loan than a client that invested in a less useful asset

Hypothesis 24: A client that has experience in the sector is more successful in repaying than a client without experience in the sector

Hypothesis 25: A client with a computer is more successful in repaying than a client without computer

(Changed) hypotheses that are observed in the empirics, so not rejected in part B:

Hypothesis 2: A client with a good lifestyle and a good health is more successful in repaying than a client with a worse lifestyle

Hypothesis 4: Social capital, coming from membership of social networks, positively affects the repayment

Hypothesis 5: A client with a provable positive credit history/status is more successful in repaying than a client without a provable good credit history/status

Hypothesis 9: A client with more economic activities than his business is more successful than a client of which the business is his only source of income

Hypothesis 10: In the urban areas, clients with modern and innovative businesses are more able to repay than old-fashioned and traditional clients

Hypothesis 15: Clients that are involved in an activity in which much energy is used have a worse repayment performance than clients that do not need energy in their business activity

Hypothesis 16: Clients that are affected by complexity of public procedures have a worse repayment performance than clients that are not affected by it

Hypothesis 18: Clients with a spouse (and children) are more successful in repaying than clients without a spouse and children

Hypothesis 19: In the manufacturing sector, younger clients are more successful than elder clients

Hypothesis 21: A business with a proper and realistic planning in advance is more successful in repaying than a business without a (good and realistic) plan in advance

Hypothesis 24: A client that has experience in the sector is more successful in repaying than a client without experience in the sector

New statement: A longer grace-period negatively affects repayment

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APPENDIX 1

1.1 Dataset A

The focus of this dataset is on the *success for an MFI*, so the repayment performance of a client. A drawback of this dataset is that there are only 19 bad clients (out of 114).

Dataset	A (n=114)
Question	What are success and failure factors for the MFI?
Dependent variable	Repayment performance: arrears rate and dummy for bad client
Independent variables	
- **Personal factors**	Gender, married, children, age, completeness business plan (rating done by me)
- **Sectorial factors**	Area (urban/rural), which sector The test of these variables is a pre-test: if one of these parameters is significant, tests of the other hypotheses should happen for each sector and/or area separately
- **Combination of sectorial and personal**	Experience, handwritten (proxy for administration method and modernity)
Control variables	Loan size, grace period, instalment quantity, interest rate, expected profit

1.2 Dataset B

In this dataset is a combination of different datasets in the administration of Dinar. There are 151 observations of which the dependent variable is known, but the data of independent variables differ per observation. Most information is available for 91 observations, but the other 60 observations are also included in some analyses in chapter 5 and 6.

Dataset	B (n=151)
Question	What are factors that influence success and failure of a start-up business?
Dependent variable	Business success, measured on scale of 0-3 (rating done by Tcaci et al, 2012a)
Independent variables	
- **Personal factors**	Gender, married, children, age, completeness of business plan (rating done by me)
- **Sectorial factors**	Area(urban/rural), which sector
- **Combination of personal and sectorial**	Experience, handwritten
Available variables (control)	Loan size, grace period, instalment quantity, interest rate, expected profit, Arrears rate

1.3 Dataset C

Dataset C is based on an Excel document in which for 142 clients is checked whether they still exist and, if not, what the reason was for failure. Of the 142 clients that are evaluated on this way, there are 59 failed businesses. For 42 of them, the reason of failure is shortly described. This reason is formed by Tcaci et al. (2012a) and can be grouped in five genres: attitude, sector, economy, health and migration. The factor time strengthens these reasons, because the older the business, the more challenges it faced. A drawback of this dataset is that there is only one reason of failure mentioned, although usually failure is a result of many factors.

Dataset	C (n=142)
Question	What are the reasons for failure of a start-up business?
Variables	Start quarter, failed/not-failed business, failure reason (rating done by Tcaci et al, 2012a), repaid/not-repaid

1.4 Dataset D

This is the administration of Dinar Capital when I left Moldova.

Dataset	D (n=219)
Variables	Gender, birth date, marital status, children, sector, urban/rural, activity description, loan size, start date, end date, interest rate, repaid/not-repaid

APPENDIX 2

2.1 MODEL 1

2.1.1 METHOD

To estimate the effect of the independent variables on the arrears rate, OLS will be used.

2.1.2 MODEL TO BE TESTED

$$a_i = \alpha_1'e_i + \alpha_2'p_i + \alpha_3's_i + \alpha_4'c_i + \varepsilon_i$$

a_i = Arrears rate of client i ((arrears rate: amount due/amount outstanding)*100), A=0-100

e_i = Vector of variables that estimate the entrepreneurial attitude of client i. Contains:

- Experience in sector   measurement scale: 0-2
- Experience in doing business   measurement scale: 0-2
- Business plan is handwritten   dummy variable
- Business plan is complete   measurement scale: 1-5

p_i = Vector of variables that contain personal information:

- Gender   dummy variable
- Marital status   dummy variable
- Amount of children   measurement scale: 1-12
- Birth year   measurement scale: 1900-2000

s_i = Vector of variables that contain sectoral information:

- Urban or rural   dummy variable
- Agricultural   dummy variable
- Services   dummy variable
- Manufacturing   dummy variable
- Commerce   no value (to prevent perfect collinearity)

c_i = Vector with control variables (actually determined by MFI):

- Loan size   standardized
- Grace period   in months
- Instalment quantity   amount
- Interest rate   in percentage

$\alpha_1, \alpha_2, \alpha_3, \alpha_4$ = vectors of parameter estimates

2.1.3 EXCLUDED VARIABLES

Within e, experience in business and sector are excluded because of many missing data points and perfect collinearity. A try to make a dataset of only observations that have a value for this variable resulted in a dataset of 30 observations with no variance in some other variables (gender, marital status a.o.).
Within p, all variables are included in the analysis.
Within s, all variables are included in the analysis.
Within c, the variables are selected based on their Pearsons correlation with the dependent variable. Only grace period has a significant correlation with the dependent variable (.246 with sig .008). So only grace period is used as control variable.

2.1.4 HYPOTHESES

H_0: The arrears rate is not dependent on the mentioned personal factors, entrepreneurial attitude and sectoral factors. So $\alpha_1=\alpha_2=\alpha_3=\alpha_4=0$

H_1: $\alpha_1=\alpha_2=\alpha_3=\alpha_4=0$ is not true

2.1.5 FIT OF THE MODEL

F-value (11): 1.840 with p-value=.144 which is not significant with $\alpha=0.1$

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	22667,293	11	2060,663	1,840	,114[a]
	Residual	22393,787	20	1119,689		
	Total	45061,080	31			

a. Predictors: (Constant), age, grace period, married, 1=uncomplete, 5=complete, manufacturing, male=1, services, children,

handwritten, urban, agriculture

b. Dependent Variable: due/outstanding

T-test of the parameters: all circled parameters are significant ($\alpha=0.1$) However, the model as a whole is not significant, so these parameters cannot be interpreted.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9,036	61,738		,146	,885
	Urban	69,7[18]	34,551	,725	2,018	,057
	Handwritten	1,296	19,842	,016	,065	,949
	Male=1	-32,647	16,584	-,391	-1,969	,063
	Children	-3,518	2,840	-,235	-1,239	,230
	Married	21,205	32,312	,165	,656	,519
	1=uncomplete, 5=complete	-5,571	6,983	-,144	-,798	,434
	grace period	3,039	1,333	,381	2,280	,034
	Agriculture	-22,497	35,515	-,285	-,633	,534
	Services	-8,454	36,916	-,075	-,229	,821
	Manufacturing	-68,035	39,349	-,658	-1,729	,099
	Age	1,268	1,021	,272	1,242	,229

a. Dependent Variable: due/outstanding

2.1.6 CONCLUSION

H_0 cannot be rejected, so the explanatory variables do not explain the repayment performance of the clients.

2.2 MODEL 2

2.2.1 METHOD

Because de dependent variable is a binary variable, not whether the client repays well, but the probability that the client is a good performer will be estimated. A Probit analysis will be done to practice this.

2.2.2 MODEL TO BE TESTED

$$p_i = Pr(b_i=1) = F(x_i'\beta)$$

$b_i =$ Bad client variable, 1: client i has an amount due, 0: client i does not have an amount due, B=0,1

$F =$ An incresing and differentiable function form $(-\infty,\infty)$ to $[0, 1]$ (to transform the formula to a probability distribution).

$x_i =$ Vector that contains all independent variables in e_i, p_i, s_i and c_i with:

$e_i =$ Vector of variables that estimate the entrepreneurial attitude of client i:
- Experience in sector   measurement scale: 0-2
- Experience in doing business   measurement scale: 0-2
- Business plan is handwritten   dummy variable
- Business plan is complete measurement scale: 1-5

$p_i =$ Vector of variables that contain personal information:
- Gender   dummy variable
- Marital status   dummy variable
- Amount of children   measurement scale: 1-12
- Age   measurement scale: 1,2,3-59

$s_i =$ Vector of variables that contain sectoral information:
- Urban or rural   dummy variable
- Agricultural   dummy variable
- Services   dummy variable
- Manufacturing   dummy variable
- Commerce   no value (to prevent perfect collinearity)

$c_i =$ Vector with control variables (actually determined by MFI):
- Loan size   standardized
- Grace period   in months
- Instalment quantity   amount
- Interest rate   in percentage

$\beta =$ vector of parameter estimates

2.2.3 EXCLUDED VARIABLES

Within e, experience in business and sector are also excluded in this analysis because of the same reasons as in the first model.

Within p, the variables married and children are deleted because of their high correlation with age.

Within s, the variables services and manufacturing are deleted from the analysis because of the correlation with agricultural. Because a large share of the clients are involved in an agricultural activity, a difference between agricultural activity and other activities is interesting. Therefore, agricultural is the sectoral dummy that stays in the analysis. Rural/urban is also not excluded.

Within c, the variables are selected based on their Pearsons correlation with the dependent variable. As in the last analysis, only grace period has a significant correlation with the dependent variable (.241 with sig .010). So only grace period is used as control variable.

2.2.4 HYPOTHESES

H_0= Whether a client is bad, is not dependent on the mentioned personal factor, entrepreneurial attitude and sectoral factors. So all values in β are 0
H_1= β≠0

2.2.5 FIT OF THE MODEL

An optimal solution is found (after 20 iterations). The Chi-square test is not significant (α=0.1) which indicates that the expected cell frequencies do not greatly differ from the observed cell frequencies. This indicates a good fit.

Chi-Square Tests

		Chi-Square	df[a]	Sig.
LOGIT	Pearson Goodness-of-Fit Test	71,648	78	,681

a. Statistics based on individual cases differ from statistics based on aggregated cases.

Although this statistics look good, several comments can be posted by this model:
- Only 86 of the cases are valid and the natural response rate is only 11.
- The parameter estimates are all not significant (α=0.1) except for urban (Z=2.035, sig:.042) Urban has a positive influence on the dependent variable, so a negative influence on the repayment performance of a client.

Parameter Estimates

	Parameter	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
LOGIT[a]	Handwritten	,428	,993	,431	,666	-1,517	2,374
	1=uncomplete, 5=complete	-,394	,475	-,828	,408	-1,325	,538
	male=1	-1,409	,859	-1,640	,101	-3,094	,275
	Agriculture	,999	1,068	,935	,350	-1,095	3,093
	Urban	3,247	1,254	2,590	,010	,789	5,705
	grace period	,102	,060	1,709	,087	-,015	,218
	Ageyears	-,007	,042	-,170	,865	-,090	,075
	Intercept	-1,349	3,220	-,419	,675	-4,570	1,871

a. LOGIT model: LOG(p/(1-p)) = Intercept + BX

Because all other estimators are not significant and several explanatory variables needed to be excluded, the meaning of this model for our hypothesis about relevant explanatory variables is very weak.

2.2.6 CONCLUSION

H_0 cannot be rejected, so this model is not able to explain the repayment performance of clients.

APPENDIX 3

3.1 METHOD

The dependent variable is a multiple response variable with an ordered outcome. Because business success of 1 is not twice as small as a business success of 2, a normal OLS is not a good way of estimating this model. The multinominal logit technique will be used.

3.2 MODEL TO BE TESTED

$$p_{i0} \equiv \text{Prob} (y_i=0) = F (\gamma_0 - x_i'\beta)$$
$$p_{i1} \equiv \text{Prob} (y_i=1) = F (\gamma_1 - x_i'\beta) - F (\gamma_0 - x_i'\beta)$$
$$p_{i2} \equiv \text{Prob} (y_i=2) = F (\gamma_2 - x_i'\beta) - F (\gamma_1 - x_i'\beta)$$
$$p_{i3} \equiv \text{Prob} (y_i=3) = 1 - F (\gamma_2 - x_i'\beta)$$

$y_i=$ Performance of business of client i according to opinion Tcaci et al.(2012a) , A=0-3

$x_i=$ Vector of variables that covers entrepreneurial attitude (e), personal information(p) and sectoral information(s) and control variables (c).

$e_i=$ Vector of variables that estimate the entrepreneurial attitude of client i. Contains:
- Experience in sector   measurement scale: 0-2
- Experience in having business   measurement scale: 0-2
- Business plan is handwritten   dummy variable
- Business plan is complete measurement scale: 1-5

$p_i=$ Vector of variables that contain personal information:
- Gender   dummy variable
- Marital status   dummy variable
- Amount of children   measurement scale: 1-12
- Birth year   measurement scale: 1900-2000

$s_i=$ Vector of variables that contain sectoral information:
- Urban or rural   dummy variable
- Agricultural   dummy variable
- Services   dummy variable
- Manufacturing   dummy variable
- Commerce   no value (to prevent perfect collinearity)

$c_i=$ Vector with control variables:
- Loan size   Standardized
- Grace period   in months
- Instalment quantity   amount
- Interest rate   in percentage
- Expected profit (as described in business plan)   in MDL
- Start quarter   1=first quarter of 2006

$\beta=$ Vector of parameter estimates

$\gamma's=$ Cut off points (calculated within the technique)

3.3 DELETED VARIABLES

Because the multinominal logit technique requires the data to be complete (otherwise the whole observation will be dropped) the variables with a lot of missing data are deleted. Those are experience in sector and business, married and children. As control variable, again only grace period is used.

3.4 HYPOTHESES

H_0: The business success of a client is not dependent on the mentioned personal factors, entrepreneurial attitude and sectoral factors. So $\beta=0$

H_1: $\beta=0$ is not true. At least one of the explanatory variables in the model is not 0.

3.5 FIT OF THE MODEL

Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	139,376			
Final	103,339	36,037	24	,054

Pseudo R-Square

Cox and Snell	,382
Nagelkerke	,424
McFadden	,209

The Chi-square test is significant at the $\alpha=0.1$ level, and not significant at the $\alpha=0.05$ level. The pseudo R-squares are all not significant. The likelihood ratio test shows only one significant parameter: grace period. The estimated coefficient for grace period is also the only significant parameter estimate in the model ($\alpha=0.05$).

3.6 CONCLUSION

Again this model does not fit to the data obtained in Dinar Capital. H_0 cannot be rejected, so it is not shown that the independent parameters influence the dependent parameter.

APPENDIX 4

Of all clients of which the repayment period is over (n=136), the division of activities is:
Within agriculture

Sub-sector	Amount of clients	Amount of bad clients
Apiary	8	2
Chickens	2	1
Cows	5	1
Ducks	1	0
Pigs	5	1
Quail	1	1
Fish	1	0
Sheep and goats	7	2
Rabbits	5	2
Vegetables	12	2
Greenhouse	20	6
Raspberry	1	0
Strawberry	2	1
Potatoes	7	2
Watermelon	1	1
Sunflower oil	2	1
Grapes	2	0
Nuts	1	1

Within services

Sub-sector	Amount of clients	Amount of bad clients
Auto	4	2
Catering	1	1
Coffee house	1	1
Decoration	1	0
Massage	1	0
Tractor services	1	0
Hairdresser	1	0
Fitness equipment	1	0
Electrician	1	0
Photo	1	1

Within manufacturing

Sub-sector	Amount of clients	Amount of bad clients
Brick stones	5	4
Building and construction	3	2
Doors and windows	1	0
Carpenter	6	1
Furniture	4	1
Tailoring	4	3
Baton	1	0
Basket weaving	1	1
Artists/painting	1	0

Products from metal	1	0

Within commerce

Sub-sector	Amount of clients	Amount of bad clients
Shop in auto parts	2	1
Tailoring shop (sewing machines)	1	0
Vegetables	1	1
Cars	1	0
Small items	1	1
Office supplies	2	1

APPENDIX 5

The aim of this analysis is to check it is good to check whether the repayment performance does not mainly depend on something else than personal, sectoral and regional characteristics. Checked are the period in which the clients took the loan and the loan design.

Time

In graph A5.1 we see that in earlier periods, the repayment performance was worse than in later periods. For this graph, all clients that already should finished their repayment, are taken into account. The start quarter numbers refer to a quarter varying from 1 (3th quarter of 2005) until 23 (1st quarter of 2011). Especially quarter 7(which is the 1st quarter of 2007) is notable, because in that quarter there was an enormous increase of clients and after their loan term it seemed that especially these clients did have repayment problems. Is it because the MFI had less resources per client, because the MFI used a 'weaker' policy, or is it because of the characteristics mentioned in the last chapters?

Graph A5.1
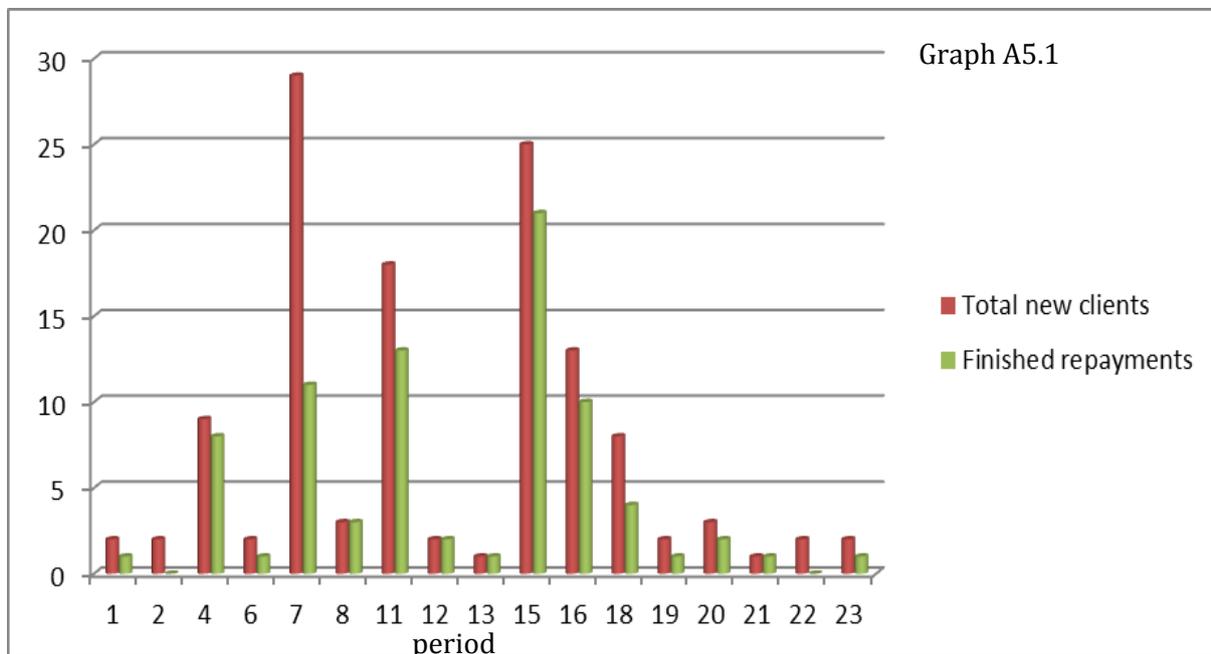
Available resources per client

To test whether the repayment performance is negatively affected by the total amount of clients, the correlation between the amount of new clients per period and the relative repayment of that group can be checked. If that correlation is significant and high, the reason for failure in the 7th quarter is that there was a shortage of resources (coaching, monitoring etc.) per client.

Table A5.1		Totalamountclients
Percentagebadclient	Pearson Correlation	-.033
	Sig. (2-tailed)	.901
	N	17

In table A5.1 we see that the correlation is very small and not significant. The reason for bad repayment is not that less resources per client are available. The large failure of clients in the

start of 2007 may be a result of a severe drought in the summer of 2007 (7 of the bad clients worked in agriculture) and shortfalls in the macroeconomic environment, partly caused by the Russian import ban on wine in 2006. (World Bank a, 2012) In chapter 4 we found that the repayment performance of manufacturing businesses is worse than the repayment performance in other sectors. In the first quarter of 2007, 10 of the 29 selected clients are working in the manufacturing sector, which is an overrepresentation of manufacturing clients. Therefore this exceptional quarter probably has nothing to do with time differences or resources constraint.

Loan design

The characteristics of the loan products differed through time and personal exceptions are made. That clients of some start quarters have a better repayment performance than clients of other start quarters, may be the result of differences in policy of the MFI. The available characteristics about the loan design are loan size (in local currency), loan term (in months), the grace period (in months), the interest rate and the quantity of instalments. In table A5.2 we see that there is significant cross-correlation between instalment quantity and loan size and loan term. There is also significant correlation between grace period and the dependent variable.

Table A5.2							Instalment quantity
		bad client	loan size	credit term	grace period	interest rate	
bad client	Pearson Correlation	1	-.070	-.055	.241	-.026	.030
	Sig. (2-tailed)		.460	.559	.010	.783	.754
	N	114	114	114	114	114	112
loan size	Pearson Correlation	-.070	1	.170	.040	.143	.416
	Sig. (2-tailed)	.460		.071	.671	.128	.000
	N	114	114	114	114	114	112
credit term	Pearson Correlation	-.055	.170	1	.034	.054	.338
	Sig. (2-tailed)	.559	.071		.721	.566	.000
	N	114	114	114	114	114	112
grace period	Pearson Correlation	.241	.040	.034	1	-.047	.096
	Sig. (2-tailed)	.010	.671	.721		.618	.315
	N	114	114	114	114	114	112
interest rate	Pearson Correlation	-.026	.143	.054	-.047	1	.116
	Sig. (2-tailed)	.783	.128	.566	.618		.224
	N	114	114	114	114	114	112
Instalment quantity	Pearson Correlation	.030	.416	.338	.096	.116	1
	Sig. (2-tailed)	.754	.000	.000	.315	.224	
	N	112	112	112	112	112	112

Correlations

**. Correlation is significant at the 0.01 level (2-tailed).

PROBIT ANALYSIS

This is the output of a probit analysis on a model in which 'bad client' is predicted by the grace period, the standardized loan size and the interest rate. The fit of the model is partly explained by the Chi-square test. This is not significant (α=0.1) which indicates that the expected cell frequencies do not greatly differ from the observed cell frequencies. The optimal solution is found after 26 iterations and only one of the explanatory variables has a significant parameter estimate: grace period(with α=0.05 and p=0.004).

Data Information

		N of Cases
Valid		69
Rejected	Missing	45
	Number of Responses > Number of Subjects	0
Control Group		34

Convergence Information

	Number of Iterations	Optimal Solution Found
PROBIT	26	Yes

Parameter Estimates

	Parameter	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
PROBIT[a]	grace period	.143	.050	2.853	.004	.045	.240
	Zscore: loansize	-.225	.276	-.813	.416	-.766	.317
	Interestrate	-9.251	23.771	-.389	.697	-55.841	37.340
	Intercept	-1.066	1.433	-.744	.457	-2.498	.367

a. PROBIT model: PROBIT(p) = Intercept + BX

Covariances and Correlations of Parameter Estimates

		grace period	Zscore: loansize	interestrate
PROBIT	grace period	.002	-.264	-.110
	Zscore: loansize	-.004	.076	.051
	Interestrate	-.130	.334	565.064

Chi-Square Tests

		Chi-Square	df[a]	Sig.
PROBIT	Pearson Goodness-of-Fit Test	66.704	65	.418

a. Statistics based on individual cases differ from statistics based on aggregated cases.

OLS

This is the output of an OLS on a model in which 'arrears rate' (which is (amount due/amount outstanding)) is predicted by the grace period, the standardized loan size and the interest rate. The model as a whole is significant (F=2.985, p=0.025 and α=0.05 is used). However, when testing each of the parameters separately, only one parameter is significant: again the grace period (with α=0.05 and p=0.002).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.397[a]	.157	.105	30.5080

a. Predictors: (Constant), in months, grace period, interestrate, Zscore: loansize

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11112.479	4	2778.120	2.985	.025[a]
	Residual	59567.249	64	930.738		
	Total	70679.729	68			

a. Predictors: (Constant), in months, grace period, interestrate, Zscore: loansize

b. Dependent Variable: due/outstanding

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	25.642	26.799		.957	.342
	grace period	2.871	.912	.363	3.148	.002
	Zscore: loansize	-2.397	4.151	-.074	-.577	.566
	interestrate	-58.818	331.020	-.022	-.178	.860
	in months	-.747	.587	-.152	-1.272	.208

a. Dependent Variable: due/outstanding

So the 'weaker' policy via a **longer grace period** can be seen as a reason for failure. In a new OLS with 'grace period' as the only explanatory variable, the model is significant as are the parameters for the constant and grace period. However, the variance explained (R^2) is only 0.061, so not enough to explain the whole repayment performance.

Conclusion

We saw that the repayment performance cannot be explained fully by time trends or the loan design. It is found that the length of the grace period negatively affects repayment performance. It will be added in the chart in the next chapter. The amount of new clients, loan size, interest rate, credit term and the quantity of instalments do not significantly influence the repayment performance. Therefore, looking at client and sectorial characteristics to explain repayment performance is not wrong to do, although the results of that efforts are disappointing until now.