Milada Kasarjyan

Improving the functioning of the
rural financial markets of Armenia

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Improving the functioning of the rural financial markets of Armenia

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ZUSAMMENFASSUNG

Der Zusammenbruch des zentralistisch gesteuerten Systems im Jahr 1990 brachte Armenien einen deutlichen wirtschaftlichen Rückgang und eine Zunahme von Armut. Im Jahr 1993 sank das Bruttoinlandsprodukt (BIP) auf 47 % des Niveaus von 1990. Dies wurde durch mehrere Faktoren bedingt. Ein Aspekt des Transformationsprozesses bestand darin, dass der Rat für Gegenseitige Wirtschaftshilfe demontiert worden war und die armenische Industrie damit ihre Exportmärkte verloren hatte. Darüber hinaus wurde Armenien in einen Krieg mit dem benachbarten Aserbaidschan über das Gebiet Berg-Karabach beteiligt. Dies führte zur Schließung der wichtigsten Handelsrouten Armeniens, einer Blockade des Landes und einem Zustrom einer großen Zahl von Flüchtlingen. Infolgedessen stieg Anfang der 1990er Jahre die Armut drastisch an.

Die armenische Regierung reagierte auf die schwierige sozio-ökonomische Lage durch die rasche Umsetzung einer Reihe von Reformen. Die Industrie war praktisch nicht funktionsfähig und die einzige Möglichkeit, um das nationale Überleben zu sichern, bestand im strukturellen Wandel des Agrarsektors. Als eine der ersten Reformen wurde der Boden privatisiert, was eine Verlagerung hin zu kleinbetrieblicher Produktion (*small-scale production*) bewirkte. Die Privatisierung des Viehbestandes und anderer Produktionsressourcen folgte als nächster Schritt.

Es waren jedoch keine adäquaten Institutionen zur Unterstützung der privaten Landwirtschaft vorhanden oder geschaffen worden. Während andere Transformationsländer den Schwerpunkt der Reformen nicht nur auf dar Boden Privatisierung Land Tenure System, sondern auch auf den ländlichen Finanzmarkt Entwicklung setzten, sind in Armenien ländliche Finanzinstitutionen mit einem Angebot der erforderlichen Dienstleistungen für den kleinbetrieblicher (*small-scale*) Agrarsektor zwei Jahrzehnte nach dem Beginn der Transformation noch immer unterentwickelt.

Die theoretische Literatur zeigt, dass Sozialkapital bzw. soziale Netzwerke den Zugang zu ansonsten fehlenden Produktionsfaktoren wie finanzielle Ressourcen erleichtern. Darüber hinaus wird davon ausgegangen, dass das Vorhandensein von individuellem Sozialkapital kollektives Handeln und bessere Ergebnisse in den Gemeinden erleichtert.

Die vorliegende Arbeit analysiert mit Hilfe der Social Network Analysis die Rolle des Sozialkapitals beim Zugang zu Produktionsressourcen, insbesondere den Zugang zu Informationen und Mikrokrediten. Darüber hinaus bestimmt sie empirisch die Bedeutung von Sozialkapital für die Rückzahlungsleistungen von

einzelnen Mitgliedern im System der gemeinschulderischen Kreditgruppen. Die Bedeutung sowohl der kognitiven als auch der strukturellen Sozialkapitalindikatoren zeigt, dass es wichtig ist, verschiedene Formen von Sozialkapital in einer solchen Analyse zu betrachten. Die Betrachtung nur eines Typs, des strukturellen oder kognitiven unter Ausschluss des anderen, kann zu überbewerteten und verzerrten Ergebnissen führen.

Die Ergebnisse lassen darauf schließen, dass die Transformation nicht nur sozioökonomische Veränderungen, sondern auch Veränderungen in den sozialen Strukturen und sozialen Netzwerken zur Unterstützung des ländlichen Raumes Armeniens gebracht hat. Obwohl die Dorfkultur bewahrt geblieben scheint, bieten soziale Netzwerke zuerst deren Mitgliedern Vorrang und Vergünstigungen.

Sozialkapital bzw. soziale Netzwerke spielen in der Tat eine wichtige Rolle beim Zugang zu Produktionsressourcen. Allerdings ist das Sozialkapital ungleich verteilt und es bestehen große Unterschiede im Umfang von Hilfe und Unterstützung, die die verschiedenen Mitglieder des Netzwerks genießen. Überdies konzentriert sich die soziale Macht um ein paar Mitglieder des Netzwerks herum. Außerdem unterscheidet sich die Geschwindigkeit, mit der Informationen die verschiedenen Mitglieder des Netzwerks erreichen. Diejenigen, die als erste Informationen erhalten, können den größten Nutzen daraus ziehen.

Sozialkapital auf Gruppenebene, sowohl kognitiv als auch strukturell, erweist sich als eine wesentliche Determinante für gutes Rückzahlungsverhalten bei gesamtschuldnerischer Haftung der Gruppenmitglieder. Interessant ist, dass diejenigen Kreditgruppenmitglieder, die in mehr als einer Dorfvereinigung als Mitglieder registriert waren, ein besseres Rückzahlungsverhalten zeigten. Dies kann eine Folge des Wunsches sein, den guten Ruf aufrecht zu erhalten, um sich wirtschaftliche und soziale Vorteile aus verschiedenen Quellen zu sichern. Diejenigen Kreditgruppenmitglieder, die erklärt hatten, den meisten ihrer Kollegen zu vertrauen, zeigten bessere Rückzahlungsaufzeichnungen. Somit ist das Vertrauen in der Gruppe untereinander eine wesentliche Determinante für den Erfolg solcher Gruppen.

Die Auswirkungen des allgemeinen Vertrauens im Dorf auf das Rückzahlungsverhalten sind moderat. Die Existenz einer Reihe von Vereinigungen im Dorf zeigt keine signifikante Wirkung, solange der Kreditnehmer nicht Mitglied einer Vereinigung ist. Somit ist Sozialkapital auf Gruppenebene eine wichtige Determinante für das Funktionieren solcher Gruppen, während Sozialkapital auf Dorfebene keine signifikante Wirkung zeigt.

SUMMARY

The break-up of the centrally directed system in 1990 in Armenia brought severe economic decline and increased poverty. In 1993, the gross domestic product (GDP) dropped to 47 % of the 1990 level. This was conditioned by several factors. One aspect of the transition process was that the Council of Mutual Economic Assistance was dismantled and by that, Armenia lost its industrial export markets. In addition, Armenia was involved in a war with neighboring Azerbaijan over the territory of Nagorno Karabakh. This resulted in the closing of Armenia's main trading routs, in the blockade of the country, and in the inflow of large numbers of refugees. Subsequently, in the beginning of the 1990s, poverty increased dramatically.

The Armenian Government reacted to the difficult socio-economic situation by rapidly implementing a range of reforms. Industry was practically not functioning and the only possible option for the country was the structural change of agricultural sector. One of the first reforms was the privatization of land, which shifted the country to private small-scale production. The privatization of livestock and other productive resources was the next step.

Adequate institutions, however, were not in place or created to support agriculture under private ownership. Rural financial institutions that offer adequate services to the private small-scale farming sector are still underdeveloped two decades after the beginning of transition in Armenia.

Theoretical literature suggests that social capital, respectively the underlying social networks, facilitate access to otherwise lacking production factors such as financial resources. In addition, the manifestation of different dimensions of social capital is suggested to facilitate collective action and better outcomes in communities.

This work analyses by means of Social Network Analysis the role of social capital (bonding and bridging dimensions) in accessing productive resources, in particular access to information and micro-credit. In addition, it determines empirically the significance of social capital (structural and cognitive dimensions) for the credit repayment performance of joint liability borrowing group members. The significance of both cognitive and structural social capital shows that it is essential to consider different dimensions of social capital in such an analysis. Otherwise, analysis may result to biased results.

The results suggest that transition brought not only socio-economic changes but also changes of social structures and social support networks to rural Armenia. Though village culture appears to be preserved, social support networks prioritise and benefit the kin members first.

Social capital, respectively bonding and bridging relations in social networks, indeed play an important role for access to productive resources. However, social capital is unevenly distributed and there is much of difference in the amount of help and support that different network members enjoy. In addition, the social power is concentrated around a few network members. Moreover, the speed with which information reaches different network members differs. Thus, those who get the information first may benefit the most.

Group level social capital, both cognitive and structural dimensions, is found to be a significant determinant for good credit repayment behaviour of joint liability credit group members. Interestingly, the credit group members who were registered as members in village associations showed a better repayment performance. This may be a result of the desire to keep the reputation in order to secure the economic and social benefits from different sources. Those credit group members who stated to trust most of their fellow members showed better repayment records. Thus, trust towards each other in the group is a significant determinant of the success of such groups.

The impact of generalised trust in the village on the credit repayment performance is moderate. The existence of a number of associations in the village does not show a significant effect as far as the borrower is not a member of the association. Thus, group level social capital is more important determinant of well functioning of such groups than village level social capital is.

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LIST OF ABBREVIATIONS

ACBA	Agricultural Cooperative Bank of Armenia Credit Agricola
AMD	Armenian Drams
CARD	Center for Agribusiness and Rural Development
GAF	German Armenian Fund
CBA	Central Bank of Armenia
CGAP	Consulting Group to Assist the Poor
CFOA	Community Finance Officers Association
CMEA	Council of Mutual Economic Assistance
ECA	Eastern European and Central Asian (ECA
ECLOF	Ecumenical Church Loan Fund
FINCA	Foundation for International Community Assistance
FAO	Food and Agricultural Organisation of the United Nations
FSS	Financially Self Sufficient
GAO	Gross Agricultural Output
GDP	Gross Domestic Product
HSBC	Honkong and Shanghai Banking Corporation
IFAD	International Fund for Agricultural Development
IOM	International Organisation for Migration
LLC	Limited Liability Company
ITB	International Trade Bank
MBB	Micro Banking Bulletin
MEDI	Microenterprise Development Initiative
ML	Maximum Likelihood
MFI	Microfinance Intermediaries
NGO	Non Governmental Organisation

NSS	National Statistical Service of the Republic of Armenia
OLS	Ordinary Least Squares
QAP	Quadratic Assignment Procedure
RFI	Rural Financial Institutions
ROSCA	Rotating Savings and Credit Associations
SEF	Small Enterprise Fund
SNA	Social Network Analysis
SME	Small and Medium Sized Enterprise
SHG	Self Help Groups
TACIS	Technical Aid to Commonwealth of Independent States
UMCOR	United Methodist Committee on Relief
USAID	United States Agency for International Development
USD	United States Dollar
USDA	United States Department of Agriculture
USDA MAP	USDA Marketing Assistance Project in Armenia
VTB	Vneshtorgbank
WCC	World Council of Churches
WB	World Bank

1 INTRODUCTION

1.1 Problem statement

With Armenia's transition from a centrally planned to a market economy, the agricultural sector with the rest of the economy was restructured. By the end of 1993, over 98 % of agricultural land was privatised and almost 333,000 peasant farms were created in contrast to 860 Soviet type kolkhoz/sovkhozes before (CFOA, 2003; LERMAN and MIRZAKHANIAN, 2001). Yet, after two decades of transition, the lack of adequate financial institutions supporting small scale agricultural activities has remained one of the most serious deficits in rural Armenia. Given the lack of adequate financial institutions in the rural economy and limited resources of farmers social capital of society is becoming critical in accessing financial resources in two respects.

First, in the created situation people rely on their social capital to secure economic resources and turn again to the most basic pattern of social relations, to their social networks of friends and relatives. Second, an increasing number of so-called microfinance intermediaries[1] (MFIs) mobilize social capital (that is the networks of social relations) of borrowers, using joint liability lending schemes, as a non-traditional form of collateral to provide non-bankable households with credit access. To ensure the repayment, the MFI rely on the members' collective action, social pressure and collective group responsibility is used.

Despite the existing theoretical literature it is not well documented how social networks are formed and function in post socialist communities, and to whom they provide what resources and opportunities. To the best of our knowledge, no empirical study exists to implement social network analysis in relation to credit access. Moreover, despite the existing theoretical literature, there is little empirical evidence illustrating the connection between social capital indicators – i.e. trust associational life, collective action and the repayment performance of individual members under joint liability borrowing. The existing studies rather focus on the performance of the whole group than on the performance of individual members. In particular, we did not find any empirical study conducted in post socialist countries.

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[1] Microfinance is characterised by small volumes of credit and/or savings per client. The clients are generally not bankable with regard to the formal financial sector, particularly the banking sector.

1.2 Objectives

The dissertation attempts to contribute to the existing social capital and joint liability lending literature by addressing a number of issues that remained uninvestigated by existing empirical studies. It is one of the first attempts to fill the research gap. The work is limited by the fact that is a case study, therefore, caution is exercised when interpreting the results and formulating the conclusions. More precisely, it aims to

1. study how social networks are formed and function in the study region of rural Armenia. To this extent, by studying bonding and bridging dimensions of social capital, to analyse the accessibility and use of social networks as social safety nets and as providers of new economic opportunities, such as credit from agricultural MFIs, in the local community.

2. test empirically the role of cognitive and structural dimensions of social capital in explaining the repayment performance of individual members under joint liability borrowing in the study region of rural Armenia.

1.3 Hypotheses

The dissertation is guided by the following main hypotheses.

1. The individuals with a higher stock of social capital have better access to help and support but also better access to various information sources and new economic opportunities such as access to credit from microfinance providers.

2. The individuals in key structural positions in the community and their network members have better access to productive resources and new economic opportunities such as access to credit from MFIs, than those marginal to these networks.

This is because, the type of social ties that the individuals have "can be both, a blessing and blight, while those that they do not have can deny them access to key resources" (WOOLCKOCK and NARAYAN, 2000: P. 226). The danger exists that "those who belong to social networks which already have access to resource allocation decisions of the state or the private sector or are in privileged positions in the communities are much more likely to continue to be included in societal processes than those who do not have such access" (NARAYAN, 1999: P. 5). "Social exclusion" meaning being excluded from a certain social relations leads to being excluded from the opportunities to be employed or to receive credit (SEN, 2000).

3. Social capital impacts joint liability borrowing group members' repayment performance. The impact can be either positive or negative.

Under joint liability lending condition social collateral (horizontal social relations) of borrowers takes the place of traditionally accepted forms of physical collateral. Thus, joint liability lending relies upon social capital of borrowers (BESLEY and COATE, 1995). Social pressure and collective group responsibility are used to

ensure timely repayment and the proper usage of loans. As such groups are formed based on self selection criteria, the function of screening, monitoring, and enforcement of loans is transferred to borrowing group members. Peer group members have better access to information on reputation, creditworthiness and an intended purpose of co borrowers (STIGLIZ, 1990) and have better possibility to enforce repayment by implementing social sanctions against defaulters (BESLAY and COATE, 1995) Thus, positive impact is expected.

However DIAGNE (1998), as cited by SIMTOWE and ZELLER (2006), argues that for effective monitoring and enforcement of loans the group members should have access to relevant information but as well be willing to be engaged in such activities. If group members believe sanctioning co borrowers may danger their social relations, and if they value these relations more than the benefit of borrowing, they may take action rather to overcome the social control and to reduce group sanctions against defaulters than to increase credit repayment. This may result to collective defaulting action. Thus, negative impact is expected.

The first two hypotheses focus on bonding and bridging dimensions of social capital. They will be tested by the use of social network analysis (SNA). The third hypothesis focuses on structural and cognitive dimensions of social capital. The econometric model will test this hypothesis.

1.4 Structure of the thesis

The rest of the thesis is structured as follows. Chapter 2 introduces the theoretical frameworks of rural finance and social capital. Chapter 3 provides an overview of the rural economy of Armenia and a detailed overview of the state of agricultural credit and rural financial markets of the country. Chapter 4 presents the so-called social network analysis, as a research method and continues with the presentation of logit regression model. Chapter 5 describes the empirical methodology of the study. First, it describes the survey procedure and data collection process. Next, it presents the network analysis procedure and the empirical model. The results are presented and are discussed in Chapter 6. Chapter 7 concludes the thesis and gives recommendations for the policy and suggestions for further research.

2 THEORY OF RURAL FINANCE AND SOCIAL CAPITAL

2.1 Rural finance, agricultural finance and microfinance

According to the CGAP (2003) definition, rural finance refers to the provision of a range of financial services to the inhabitants of all income levels in rural areas, involved both in agricultural and/or non-agricultural activities. Its aim is to increase access to financial services for rural inhabitants rather on a regional or location basis than on a sector or activity basis (YARON et al., 1997). Agricultural finance, especially in relevance to developing countries, often constitutes the most noticeable part in rural finance. It is assumed that "the majority of people living in rural areas are involved in agricultural activities and consequently agriculture generates most of rural income" (YARON et al., 1997: P. 29). Agricultural finance, thus, is a subset of rural finance which aims at increasing access to financial services for those involved in agricultural activities, such as input supply, production, distribution and marketing. The specificity of microfinance[2] is that it focuses on the poor and aims at providing financial services, such as savings, credit, payment transfers, and insurance to the poor and low income households which are denied access to traditional sources of finance (CGAP, 2003).

Figure 1:   Location of financial services for the poor
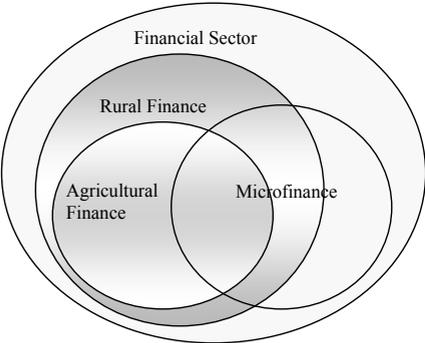
Source: CGAP (2003: p. 1).

Since the poor often lack of readily available collateral, commercial banks perceive them as clients with high credit risk inducing high transaction costs (WOOLCOCK, 1999). This contributes to their exclusion from formal financial markets (STIGLITZ, 1990), be they urban or rural.

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[2]   Although the rural and the farmers may well be often among the poor.

Microfinance addresses this problem by providing tailor-fit financial services to the poor to support entrepreneurial activities. It uses institutional innovations, such as group liability based lending (see Section 2.6) that greatly reduces the risk and cost of providing financial services to poor households (MORDUCH, 1998). Financial services for the rural poor is the overlap area of microfinance with rural and agricultural finance, see Figure 1.

However, there is an argument that though microfinance may be successful at reaching those poor which have some resources and thus can combine it with the credit and make a productive use of it, as for example found by AMIN et al. (2001) in Northern Bangladesh, it may be less successful at reaching the vulnerable. Moreover, it may even exclude the vulnerable poor.

2.2 The traditional versus the new approach to rural finance

The traditional approach to rural finance, until 1980, was characterised by high level of governmental direct interventions in the sector. That is, the loans were provided to RFIs for on lending to rural clients at the subsidised interest rates (FAO, 1998). This was based on the perception that poor people are unable to save or to pay market interest rates and cheap credit needs to be provided to rural areas. By thinking so, the fact that rural areas have as well savings potential was ignored. Need based, supply-led, sector directed distribution of loans to rural areas on subsidised interest rates was considered as the only possible way to provide financial support to rural areas (ZELLER and SHARMA, 1998). Accordingly, the focus was not on financial sustainability of institutions, but on depth of outreach of the lending (ZELLER, 2003). This approach often failed to contribute to agricultural growth, income expansion and poverty reduction. Moreover, financial institutions could not reach to sustainability and continuous flow of governmental subsidies were needed. dependent on subsidies (ZELLER and SHARMA, 1998; HEIDHUES and SCHRIEDER, 1999; ZELLER, 2003; BUCHENRIEDER and HEIDHUES, 2005). Till the mid of 1980s, the sector recorded substantial amount of failures which showed the inefficiency of the old approach (ZELLER, 2003).

The new approach to rural finance, since the mid of 1980s, focuses on the financial sustainability, institution and system building. In the new approach active role of government is in rather creating favourable policy environment for the effective functioning of financial institutions than in directly lending and intervening in the sector. This approach operates based on the demand (i.e. willingness and ability to pay market prices) for savings, credit and insurance and not on the need. Moreover, it realises that high transaction costs are often closely related with information asymmetries and moral hazard problems (STIGLIZ and WEISS, 1981 as cited by ZELLER, 2003: P. 5; BUCHENRIEDER and HEIDHUES, 2005). Thus, it searches for institutional and technological innovations to reduce the transaction costs. One of such innovations is the incorporation of the features of informal financial institutions into formal financial programs. For example, the joint liability group

lending approach largely adopts the model of informal Rotating Savings and Credit Associations[3] which is the most widespread type of loan funds run by informal groups.

2.3 The challenge of financial intermediation

Financial markets in general and rural financial markets in particular face several challenges because of so called "promissory" nature of financial contracts (FAO, 1998). That is, financial market transactions are different from that of conventional market transactions. Instead of an exchange of real goods and services the transactions here are more the monetisation of promises, which is the exchange of cash (or other goods) at present against the promise of the borrower to pay it back in future (HOFF and STIGLITZ, 1990; SWINNEN and GOW, 1997). When the bank grants a loan, it bears the risk that the borrower will break the promise to repay it back (FERRARY, 2002). In other words information in financial markets is imperfect (asymmetric). This results in high transaction costs. "Transaction costs are costs resulting from an information search and market entry and exit costs for borrowers, savers, and financial intermediaries" (HEIDHUES and SCHRIEDER, 1999: P. 13). To reduce these costs, banks search for the available information. It is normally done by the valuation of borrowers' available collateral. The clients with high risk expectation may be expected to show higher level of available collateral than those with lower risk expectation (SWINNEN and GOW, 1997). In relation to the imperfect information problem, HOFF and STIGLITZ (1990) present three general observations. "It is difficult to determine the extent of the default risk for each borrower (screening problem), it is costly to ensure that borrowers take those actions which make repayment most likely (incentives problem), it is difficult to compel repayment (enforcement problem)" (HOFF and STIGLITZ, 1990: P. 237).

Information asymmetry may lead to credit rationing, as discussed in STIGLITZ and WEISS (1981). That is, some individuals or groups, no matter how high interest rates are ready to pay, can not obtain credit because they are considered as high credit risk clients (STIGLITZ and WEISS, 1981; SWINNEN and GOW, 1997). This is so called "an optimisation approach" often used by lending institutions. The expected risk of default is so high that the lending institution cannot reasonably charge high enough interest rates to make the lending profitable (STIGLITZ and WEISS, 1981).

Two other problems characteristic for credit markets are the problems of adverse selection and moral hazard. Adverse selection means that due to asymmetric information lenders may select risky borrowers. "Adverse selection problem accrues when the borrowers that are more likely to generate undesirable outcome for the lender are the ones that more intensively searching for the loan and are more likely therefore to obtain the loan" (SWINNEN and GOW, 1997: P. 3). Moral hazard is

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[3]

the situation that after the loan is provided the borrower may take actions that increase the probability of non repayment. "Moral hazard accrues when the lender is the subject to the hazard that the borrower is likely to be engaged in activities that are not desirable for the lender" (SWINNEN and GOW, 1997: P. 3).

The idea of adverse selection makes lending institutions often reject to provide credit at all. The problem of moral hazard makes banks to look on the wealth status of borrowers to make decision to allocate credit or not (SWINNEN and GOW, 1997).

2.4 Costs and risks specific to rural and agricultural lending

In addition to the above mentioned general problems (see Section 2.3), rural and agricultural lenders face several additional challenges. The transaction costs are even higher related to the fact that rural borrowers are often unable to provide an acceptable form of loan collateral. Low population densities in rural areas and long distances among communities create additional costs. Moreover, the costs of loan appraisal, loan monitoring and enforcement are high because of often unfavourable conditions of the roads and transportation. For the rural borrowers, the transaction costs may as well be high if they have to travel to the bank branch for the loan application. This creates the high opportunity cost of lost working time and is an additional spending of money (FAO, 1998).

Agriculture has very distinct characteristics, such as "production in space", "dependency on weather conditions" which increase the risk of agricultural lending. In addition, "the seasonal nature of agricultural production long gestation period have direct implications for the transaction costs of the borrower, creating cash surpluses after harvest and cash scarcity before harvests" (ZELLER, 2003: P. 17).

2.5 Formal and informal financial institutions

HEIDHUES and SCHRIEDER (1999: P. 2) define informal finance institutions as "those that fall outside the government/central bank regulatory system in monetary affairs" and formal finance institutions as "those institutions that fall under the monetary regulations, rules and laws of the government and/or central bank". Formal institutions consist of state and agricultural development banks, cooperative financial institutions, commercial banks, insurance and leasing companies and microfinance institutions if the latter are registered with the government and/or central bank. Informal institutions are friends, relatives, neighbors, informal financial self-help groups (SHGs), local moneylenders, pawnbrokers and traders (SCHRIEDER, 1989; BOUMAN, 1990; HEIDHUES and SCHRIEDER, 1999; ZELLER, 2003). As stated by ZELLER (2003) much can be learned about the local demand and the potential form of an acceptable intervention by looking on the informal financial sector. For example, the existence of informal financial SHGs and networks of friends and relatives may indicate the potential of using groups in formal lending and saving activities (ZELLER and SHARMA, 1998). Moreover, the general features of informal financial institutions may be adopted to reduce information asymmetry

and accordingly to reduce the transaction costs. This is what an increasing number of microfinance institutions, that provide joint liability based group loans, do. Under such lending condition the groups are made responsible for screening, monitoring and enforcement of the loans (see Section 2.6). The major features of informal lending institutions is shortly discussed by looking on the lending and borrowing among relatives, friends and neighbors, lending by local moneylender, lending and borrowing within rotating savings and credit associations (ROSCAs).

2.5.1   Lending and borrowing among relatives, friends and neighbours

Lending and borrowing among relatives, friends and neighbours is the most wide-spread type of informal finance. The loans are normally small and are interest free. In the base of the transactions is the principle of reciprocity. These are widespread types of lending and are essential social insurance mechanisms especially for the poor (UDRY, 1990). Both the lender and the borrower benefit from it. The borrower gets the money which he needs at present and the lender gets a right to ask for reciprocal support in the future (ZELLER, 1998). Further, the risk of loan default is minimised as the lender and the borrower normally are part of the same social network. Within such connections benefit of maintaining the relation is greater than the benefit of defaulting (ZELLER, 2003).

2.5.2   Lending by local moneylenders

Compared to loans from friends and relatives, loans from local moneylenders are much larger in their amount and much longer in their terms. Moneylenders lend for profit making purposes accordingly charge high interest rates. Monthly rates can easily range from 5-10 % (SCHRIEDER, 1989; SCHRIEDER and CUEVAS, 1992; ZELLER, 2003). Because local moneylenders live close to the borrowers for a longer time they have a good knowledge of the credit worthiness of the borrowers. Accordingly they can establish different interest rates for different borrowers. As STIGLIZ (1990: P. 352) notes, "the local moneylenders have one important advantage over the formal (lending) institutions: they have more detailed knowledge of the borrowers. They therefore can separate out high risk and low risk borrowers and charge them appropriate interest rates".

2.5.3 Lending and borrowing within rotating savings and credit associations (ROSCAs)

Rotating credit associations (ROSCAs) are network based informal financial SHGs, which are found in both developing and developed economies (BESLEY et al., 1993; BOUMAN, 1990). They are the most common type of loan funds formed and run by informal groups. The funds are based on the members' own savings and are free from any external contribution. Thus, financial SHGs are organised, operated and meant to provide the basic personal financial intermediation services to their members (ZELLER and SHARMA, 1998; RUTHERFORD, 1999; ZELLER, 2003; CGAP, 2006). These informal financial institutions are most common in poor communities. They provide the possibility for those without access to formal credit markets (due

to the lack of physical collateral) to improve their welfare. "Welfare is raised by forming a ROSCA because some financial intermediation reduces everyone's utility cost of saving up" (BESLEY et al., 1993: P. 797). ROSCAs are response by socially connected groups to credit market exclusion (BESLEY et al., 1993).

A typical ROSCA functions as follows. At regular meetings all the members contribute an agreed amount of money to the pot. At the end of each meeting one of the members gets the whole sum of money. Normally there is an agreed type of distribution (BOUMAN, 1990; PUTNAM, 1993). The amount of the meetings is equal to the amount of the members in the group (CGAP, 2006). There exist four main ways in which the lump sum is allocated. It can be done by prior agreement, by agreement each round, by lottery or by bidding for the lump sum (RUTHERFORD, 1999).

For ROSCAs to function, it is important that the members continue contributing to the group sum even after they get their lump sum till all members receive their amount. Thus, social factors play an important role and high level of trust is required for the proper performance of ROSCAs (PUTNAM, 1993; CGAP, 2006). As the risk of default is present, only the members which are trusted by the group members are chosen. The reputation for honesty and reliability for example may serve a base for the selection of ROSCA members. An important source of ones trust may be the previous experience and the knowledge of the pre-existing social connections between individuals. For this reason, often ROSCAs are organised by people who trust and already know each other very well. In some cases the transitive trust plays a role "I trust you, because I trust her and she assures me that she trusts you" (PUTNAM et al., 1993: P. 169). ROSCAs use the existing social relations between individuals to reduce the problem of imperfect information and to increase the enforceability. In the case of default members can expect to be sanctioned socially and to be prevented from future participation (BESLEY et al., 1993). Thus the opportunistic behaviour is reduced as a result of peer pressure for good performance by all members.

2.6 The theoretical models of joint liability lending

As mentioned above an increasing numbers of microfinance institutions provide joint liability based group loans to decrease the transaction costs. By the end of 1980s a number of microfinance institutions already adopted joint liability techniques to reach the poor and disadvantageous groups of communities[4].

Following the theoretical models, joint liability lending schisms have positive impact on the repayment performance of borrowers. The expected success is basically attributed to the non-traditional characteristics of the collateral, specifically social collateral used. In the sense that social collateral of borrowers takes the place of traditionally accepted forms of physical collateral, joint liability lending

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[4] The best known example is the Grameen Bank's lending program in Bangladesh.

relies upon social capital of the group (BESLEY and COATES, 1995). Under such lending conditions, the group takes the liability for the individual loans of members and by that overcomes the problem of lack of traditional forms of collateral that they face under individual liability borrowing. Social pressure and collective group responsibility take the place of traditionally accepted forms of physical collateral. Group peer pressure is used to ensure timely repayment and the proper usage of loans. Thus, joint liability landings help banks to reduce the risk of imperfect information and related to it the transaction costs. By delegating the function of screening, monitoring, and enforcement of loans to the group members, banks overcome the problem of asymmetric information and accordingly the problem of prohibitively high transaction costs (GHATAK and GUINANE, 1999). Pointing on the main hypothesis of such programs, that is the comparative advantages of collective actions in screening, monitoring and in enforcement activities, STIGLIZ (1990) argues that group members have better access to information on reputation, creditworthiness and an intended purpose of peer borrowers. Moreover, people connected with social ties have better possibility to enforce repayment by implementing social sanctions against defaulters (BESLEY and COATE, 1995). Consequently, the horizontal social relations among actors are critical as the base for the knowledge on the reputation, credibility and enforcement. GHATAK (1999) suggests that by implementing group lending practices, banks get a chance to distinguish good borrowers from the risky ones. Under group lending schemes the good borrowers will select higher joint liability and lower interest rate contracts. Risky borrowers, on the other hand, will select lower joint liability and higher interest rate contracts. The concept of joint liability can thus be understood as a forced risk sharing arrangement technique which in theory can lead to higher repayment rates (BESLEY, 1995). ANDERSON and OSVELDO (2000) summaries the advantages of group lending techniques in four main points. Peer screening effect – meaning the evaluation of individual projects and accordingly the selection of group members is done by the borrowers thereby the transaction costs are reduced. Peer monitoring effect meaning that the individual members' activities are closely monitored by other group members thereby the probability of success and repayment is increased. Enforcement effect meaning that the borrowers put extra efforts to secure timely repayment to avoid social sanctions. Collateral effect meaning that successful members within each group repay the part of the losses caused by failed members thereby the default rate is reduced[5]. Based on (BESLEY, 1995) the advantage of enforcement of sanctions via social networks has two main features. The first is the scope of sanctions meaning that an individual who fails to fulfil the obligation to repay can be punished. The second is the depth of

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[5]   The performance of group liability contracts in developing countries has been very diverse. Several authors presented case studies of unsuccessful copies of this approach. For example, in Malawi non willingness of borrowers to repay the credit is revealed to be one of the major factors of credit default (SIMTOWE et al., 2006). For the more evidence on the limits to joint liability, see as well WOOLCOCK (1999), RAHMAN (1999).

sanction. It has been found that the social sanctions, such as the danger to be excluded from future cooperation, increase the willingness to repay (BESLEY and COATE, 1995). However, for social sanctions to work there should exist strong social ties in the group and the willingness to sanction those who default (GHATAK and GUINNANE, 1999).

BESLEY and COATE (1995) investigate the relationship between joint liability and the willingness of individual members to repay the loans. They suggest that such schemes have both positive and negative effects on repayment rates. The positive effect is that the incentive to access further loans makes successful group members to repay the loans of group members with insufficient returns. The negative effect arises when the whole group defaults. It may be that the successful group members cannot cover the losses of non successful ones, even when some members would have repaid under individual lending. CASSAR et al. (2007) found that socially homogenous groups perform better than socially heterogeneous groups and that the personal trust between group members is a more important factor for group loan repayment than the general societal trust. The most successful example of group lending practices is recorded by Grameen Bank, which was found in 1976 by Muhammad Yunus in Bangladesh. Grameen Bank has been successful in lending to the poor and disadvantageous women by concentration rather on their potential than on their possession of material assets. By lending to small homogeneous groups the bank record 99 % of repayment rates and facilitates group solidarity as well as participatory interactions (GRAMEEN BANK, 2009).

2.7   History and definitions of social capital

Social capital is a concept that describes the extent and nature of people's relationships with each other, with their communities, various services, institutions and systems (STONE, 2003). Accordingly, different definitions can be found in literature depending on the scope of observations. It ranges from the micro to the meso to the macro levels (see Section 2.8.1). A specific definition followed depends on the discipline and on which level is the analysis in a particular study. This work adopts and accordingly discusses in more details the micro level definitions of social capital, which emphasise the role of social networks and social ties for individual's access to resources and opportunities as being the most relevant to our study.

The use of the concept in the growth theory of economic development is relatively new. Till recently, growth theorists considered natural, physical and human capital as the main production factors in economic analysis. These factors were used to explain the economic outcomes of societies and countries. However, through the history it was observed that "countries, regions or cities within countries and even communities within regions or cities with similar endowment of natural, physical, and human capital have achieved very different levels of economic performance" (GROOTAERT, 1998: P. 1). For exapmle, STIGLIZ (1996) revealed that the economic welfare of the East Asia is partly due to government policies,

institutional design and the cooperation between government and institutions. PUTNAM (1993) found that the better growth of the northern part of Italy in relation to the south part is partly due to the existence of dense voluntary associations.

It became slowly obvious that traditionally accepted types of capital do not fully explain the economic outcomes and that the existing relations and interactions among economic actors may play a role. The missing link in the traditional approach, as GROOTAERT (1998) calls it, is social capital.

Though the use of the concept is relatively new to economic analysis, it has much longer presence in other sciences. The implicit reference to the term was made already by TOQCUEVILLE (1840: P. 4) who points on "those associations that are formed in civil life without reference to political objects as the art of pursuing in common the object of the common desires". TOQCUEVILLE (1840: P. 4) argues that "societies become powerless if they do not learn voluntarily to help one another". The first explicit reference to social capital was made by HANIFAN (1920) intalking about rural community centers. He used social capital to discuss "that in life which tend to make the tangible substances count for most in the daily lives of a people; namely, good will, fellowship, sympathy, and social intercourse among the individuals and families who make up a social unit …" (HANIFAN, 1920: P. 22). Other notable scholarly contributions were made by JACOBS (1961) in relation to urban life and BOURDIEU (1986) with regard to social theory. JACOBS (1961: P. 72) uses the concept in the context of local communities and defines it in terms of informal neighbourhood networks: "lowly, unpurposeful and random as they may appear, sidewalk contacts are the small change from which a city's wealth of public life may grow. These networks are city's irreplaceable social capital. Whenever the capital is lost, from whatever cause, the income from it disappears, never to return until and unless new capital is slowly accumulated". BOURDIEU (1986) in his definition of social capital raises the question of social class one belongs to and an ability of an individual to obtain resources through his social network.

2.8 The dimensions of social capital

Recent academic literature distinguishes four main dimensions of social capital, which are its scope (unit of observation), its forms (manifestations), the channels through which it operates, and the type of relationships (GROOTAERT and VAN BASTELAER, 2002: PP. 2-4). These dimensions of social capital will be in the following discussed in more details.

2.8.1   The scope of social capital (micro, meso and macro levels)

Social capital is identifiable at any level, it can be observed on the level of individual to the level of nation. Accordingly, the scope of observation can be at the micro level (among individuals), the meso level (among groups, associations) or at the macro level (among whole societies), see Figure 2.

The micro-level definitions, used in this study, of the concept focus on the importance and the role of social networks and social ties for individuals and groups (BOURDIEU, 1986; PUTNAM, 2000; STONE, 2001). Based on BOURDIEU (1986: P. 249), social capital "is the sum of resources, actual and potential, that accrue to an individual or a group by virtue of possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition". Following PUTNAM (2000: P. 19), social capital refers to "connections among individuals – social networks and the norms, reciprocity and trustworthiness that arise from them". Similarly, STONE (2001: P. 4) sees social capital "as networks of social relations, which are characterised by norms of trust and reciprocity".

A social network is defined as a group of an interconnected people who usually share a common attribute (PRODUCTIVITY COMMISSION, 2003). For example, they may have the same religion, live in the same neighbourhood, belong to the same family or friends circle. Social networks usually fallow their own social norms which regulate behaviour of its members. These are informal, however, informally accepted and in this sense institutionalised relationships which are internalised and enforced by social control. Mutual obligations, trust and reciprocity are such examples[6]. It is argued that trust and reciprocity is more likely to exist and to better function in horizontal groups, such as the groups based on kinship and friendship (PRODUCTIVITY COMMISSION, 2003; GROOTAERT, 1998). In dense horizontal networks information flow and information spread is fast and this forces the network members to behave in a trustworthy manner.

The meso-level observations emphasise the importance of groups and associations for the economic outcomes of societies. According to COLEMAN (1988: P. 98) "social capital is a variety of different entities, with two elements in common: they all consist of some aspects of social structure, and they facilitate certain action of the actors – whether personal or corporate actors – within the structure". Thus, social capital is seen as a product of social structures of communities which facilitate cooperation and coordination among actors. Implicitly, this definition refers to both horizontal as well as vertical relations.

The macro-level observationof social capital is presented by OLSON (1982) and NORTH (1990). According to this view, as stated by BASTELAER (2000), social capital implicitly includes as well the most formalised relations and norms in the society, national level institutions and structures (the rule of law, efficient administrative and legal system).

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[6] Joint liability based lending practices show how micro level social capital can be used to overcome the poor's access to credit markets.

Figure 2:   The levels of social capital
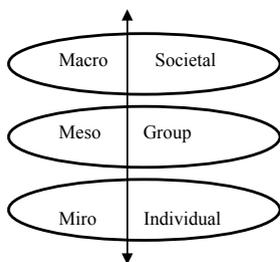
Source: CLARIDGE (2009).

2.8.2   Structural and cognitive social capital

In respect to its forms, social capital is divided into structural and cognitive one. Structural social capital facilitates "information sharing, collective action and decision making through established roles and social networks, rules and precedents" (UPHOFF, 1999: P. 218). Structural social capital is easily observable in that it can be easily measured, for example, by the number of associations and their members. Cognitive social capital consists of "shared norms, values, trust, attitudes and beliefs" (UPHOFF, 1999: P. 218). Compared to structural social capital, cognitive social capital is more difficult to observe. Cognitive and structural social capital are connected, interactive and mutually reinforcing (UPHOFF and WIJAYARATNA, 2000). Thus, at any level social capital influences development through the inter-action of it's both forms.

The focus of this work is on micro level groupings and social networks and on the interaction of structural and cognitive social capital on a micro level.

Figure 3:   Conceptual framework of social capital
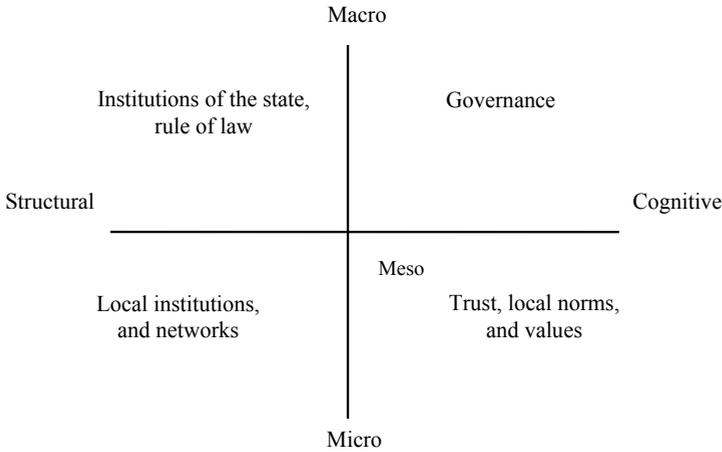
Source: GROOTAERT and VAN BASTELAER (2002: p. 4).

Figure 4:   Conceptual framework of social capital
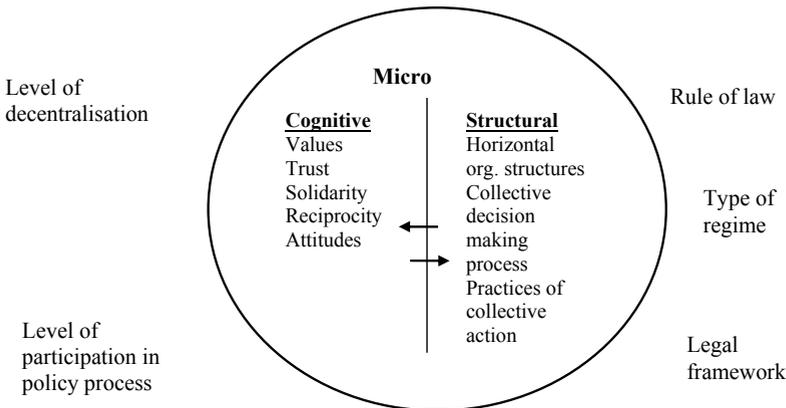
Source: BAIN and HICKS (1998), as cited by KRISHNA and SHRADER (1999: p. 9).

The conceptual framework for social capital are presented by BAIN and HICKS (1998) and GROOTAERT and VAN BASTELAER (2002), (see Figure 3 and Figure 4). GROOTAERT and VAN BASTELAER (2002) distinguish between the two main dimensions of social capital which are the level from micro to macro and the form cognitive to structural. BAIN and HICKS (1998) roughly divides social capital into micro and macro levels.

The importance of structural social capital for the development is strongly supported by communitarians who measure social capital in terms of existing associations and organisations in the community. Communitarians suggest that social capital is always beneficial. Thus, the higher density of local organizations and associations the better it is for the community.

Nevertheless, this view is criticized because it does not consider the heterogeneity of communities, meaning that communities do not automatically include and benefit all members (NARAYAN and SHAH, 1999 as cited by WOOLCOCK and NARAYAN, 2000). The kinds of groupings and associations that can generate social capital and benefits for their members often implicitly restrict outsiders (HUNTER, 2000; MORROW, 1999; SZRETER, 2000). Negative externalities arise from interpersonal interactions, demonstrated by certain interest groups, benefiting those in associations but not necessarily nonmembers or the community at large. Such examples are the dominance of certain occupations with white ethnic groups (Italians, Irish and Polish immigrants) in New York and the control of Koreans over produce business in East Coast cities (PORTES and LANDOLT, 1996).

Thus, in addition to structural social capital, the cognitive one is needed to prevent groups and group members from free-riding[7]. On a macro or national level it is argued that cultures with high levels of trust create more social capital and exhibit greater economic growth (FUKUYAMA, 1995).

2.8.3   Channels of social capital

The channels through which social capital operates include information sharing, coordination of activities, mutually beneficial collective action and decision making (GROOTAERT and VAN BASTELAER, 2002, P. 4). These features of social capital help to overcome the lack of adequate or accurate information and allow the control and coordination of actions. For instance, group based lending schemes make use of the information-sharing and mutually beneficial collective action of social capital in the sense that the group members choose each other based on available and shared information. In addition, by taking the liability for individual loans of its members and by acting collectively, in an expected manner, secure the repayment and the further access to credit (see Section 2.6). Where the expected type of behaviour (a "norm") is present, it is much easier to coordinate activities and to reduce an opportunistic behaviour of individuals (GROOTAERT, 1998).

2.8.4   Bonding, bridging and linking social capital

In respect to the type of relationship the literature on social capital distinguishes between bonding, bridging and linking social ties. Bonding social ties are defined as the relations among relatively homogenous groups. The relations between relatively heterogeneous groups are referred to as bridging social ties. By linking

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[7]   Free rider is a person that enjoys the benefits accruing from a collective effort but contributes little or at all not to this effort.

social ties, the relations between individuals and groups in different social strata in a hierarchy are meant, where power, social status and wealth are accessed by different groups (PRODUCTIVITY COMMISSION, 2003; NARAYAN, 1999; WOOLCKOCK, 1998). As found by STONE (2001, 2003) at any point of time different communities, families and even individuals have different mixes of bonding, bridging and linking social ties. Some people for example have "strong family and friendship relations (bonding social ties), whereas other people are more involved in community groups (a bridging social ties) or know many people in various organisations and institutions (linking social ties)" (STONE, 2003: P. 14). This may provide different social groups with different opportunities. As social networks are non-overlapping in their nature, the groups with close-knit and intensive stock of "bonding social ties" but with a lack of diffuse and extensive "bridging social ties" may be denied to access new opportunities in life (WOOLCKOCK, 1998; PUTNAM, 2000). Bonding social ties can act as a social support net for an individual, but bridging ties with people from different groups are necessary for gaining access to new opportunities (STONE, 2003).

Bridging social ties link people to institutions and help to gain resources. In other words, bonding social ties can act defence and help people of "getting by" in life on a daily basis. Acting offence that is "getting ahead" in contrast is facilitated through cross-cutting ties that take the form of either bridging or linking social capital (WOOLCOCK and NARAYAN, 2000). WOOLCOCK (2000) as cited by (WOOLCOCK and NARAYAN, 2000) gives graphical presentation of it (see Figure 5). He shows that for developing the poor need more diverse networks than the core ones. In fact, one might argue that one reason for poverty could very well be the limited networks the poor are involved in, which implies for stronger dependence on single ties and thus single support systems.

However, social networks can not be instituted by degree or program. They have to evolve and thus a time factor is always implicit to any network. Accordingly, there always exist the structural differences in terms of amount of bridging or linking ties and the opportunities among individuals and groups. Thus, the type of social ties that individuals have "can be both, a blessing and blight, while those they do not have can deny them access to key resources" (WOOLCKOCK and NARAYAN, 2000: P. 226). Hence, the danger exists that "those who belong to social networks which already have access to the resource allocation decisions of the state or the private sector or are in privileged positions in the communities are much more likely to continue to be included in societal processes than those who do not have such assess" (NARAYAN, 1999: P. 5).

Figure 5:   **Social capital and poverty transition**
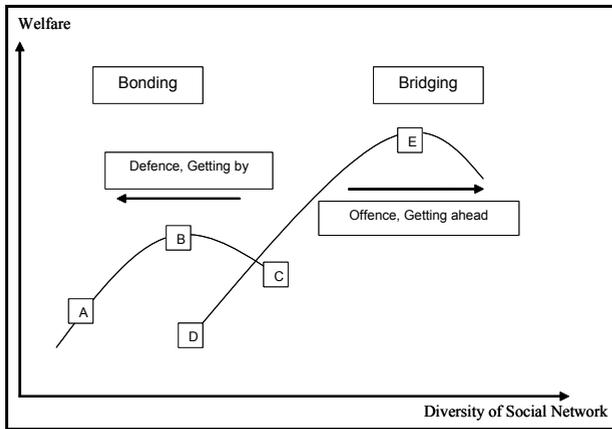
Source: WOOLCKOCK (2000), cited by WOOLCOCK and NARAYAN (2000: p. 232).

(NARAYAN, 1999) points on the negative impacts that the absence of cross-cutting (bridging and linking social capital) ties have on communities. He states that primary groups provide opportunities to group members but the same time they also reinforce pre-existing social stratification, prevent mobility of excluded groups, minorities or poor people. This gives space to corruption and co-option of power by the dominant social group. Meanwhile, cross-cutting ties which are dense and voluntary help connect people of different strata that have access to different information, resources and opportunities.

In other words, the poor who may lack cross-cutting ties (bridging social capital) outside their primary network may as well lack an entitlement to access resources through their networks. As SEN (1981) argues: the resources a person can obtain through his/her network is a part of an entitlement. Those entitlements are what an individual uses to achieve his own way of life (BERTIN and SIRVEN, 2006). Their absence brings to human capability deprivation, as what the person can reach in his life depends very much on the options a person has the opportunity to choose from.

In simple words, SMITH (1976) as cited by SEN (2000: P. 5) defines "deprivation" as an inability of an actor to appear in public without shame. The inability of a person to communicate freely with the others leads to capability deprivation which takes the form of social exclusion. "Social exclusion meaning being excluded from social relations then leads to other deprivation such as being excluded from the opportunity to be employed or to receive credit" (SEN, 2000: P. 5).

2.9   Strong and weak ties

Bonding social capital in literature often relates to "strong ties" and bridging social capital to "weak ties" of people (GITTELL and VIDAL, 1998). "Strong ties" are described as the existing connections with people have that are emotionally close to oneself, such as immediate family and close friends. It is argued that strong ties are common in traditional communities. Weak ties are described as existing connections with people emotionally distant to oneself. It is argued that weak ties are more common in modern society. GRANOVETTER'S (1973) work "Strength of Weak Ties" pointed on the importance of cross-cutting ties as means to access resources and power outside the group.

3 Overview of rural economy of Armenia

3.1 History of economic transition

Armenia started its transition from a centrally directed to a market economy in 1990. The transition brought sharp economic decline and increased poverty in the country. In 1993, the Gross Domestic Product (GDP) reached to its lowest point that is to 47 % of the 1990 level (see Table 1). Poverty, which was not observed to exist at the beginning of 1980s, increased dramatically at the end of the decade (WORLD BANK, 2007).

In 1990, the country was still facing strong economic and territorial distortions of the massive earthquake in 1988, which covered almost 40 % of Armenia's territory and destroyed economic production. With the collapse of Soviet Union in 1990, the Council of Mutual Economic Assistance (CMEA) dissolved and subsequently, the trade and mutual assistance among Soviet block countries stopped (GRIFFIN, 2002).

For Armenia it had strong negative consequences, as during the Soviet era it was a relatively industrialised country. With the collapse of CMEA Armenia lost its export markets for industrial produce. This made the situation more difficult. The same time, Armenia got involved in a war with the neighbouring Azerbaijan over the territory of Nagorno Karabakh. Azerbaijan and Turkey closed Armenia's main trade routes. Armenia stayed virtually in isolation (WORLD BANK, 2004). The war brought an inflow of refugees. This increased the number of poor. Thus, "Armenia started its transition as a semi-closed economy with high transaction costs and unusually high 'natural' protection" (GRIFFIN, 2002: P. 2).

Table 1:   The composition of GDP by economic sectors, in %

	Agriculture & Forestry	Industry	Construction	Services
1990	12.6	44.5	18.0	24.9
1991	20.2	48.6	10.4	20.8
1992	28.7	43.5	5.6	22.2
1993	46.3	30.7	4.1	18.8
1994	41.7	34.8	6.0	17.4
1995	38.5	27.8	6.5	27.2
1996	33.5	27.7	7.7	31.1
1997	29.4	22.5	16.3	31.8
1998	30.8	19.9	17.5	31.8
1999	27.2	21.2	16.7	34.9
2000	23.1	22.1	19.6	35.2

Sources: TACIS (1998: p. 18), UNDP (2001: p. 135) as cited by GRIFFIN (2002, Chapter 2: p. 2).

With the collapse of the industry and economic contacts the only sector to rely upon was agriculture. Its importance increased dramatically. The economic reforms were a response to the created situation to secure the national survival. In a short time, several economic reforms came to action, such as privatisation of land and productive enterprises and price liberalisation. The first step of reforms was privatisation of land, which started in 1991 (SPOOR, 2004; LERMAN and MIRZAKHANIAN, 2001) (see Section 3.1.1). By 1993, Armenia shifted from being an industrial country to an agricultural one, (see Table 1) (WORLD BANK, 2005).

The economy started slowly to recover in the mid of 1990s but poverty did not fall till the end of the decade (WORLD BANK, 2007).

3.1.1 Land structure and land ownership

Armenia was one of the first former Soviet Union Republics to privatise agricultural land (LERMAN and MIRZAKHANYAN, 2001). The privatisation, starting in 1991, was carried out in three stages. In the first stage, land was given to those who were registered and lived in the area before 20.01.1990. In the second stage, land was allocated to former residents of the area who expressed a wish to come back. In the third stage, land parcels were assigned to those citizens of the Republic who expressed a wish to move in and be a permanent resident in the given settlement. As a result of the privatization of the land, 332.608 peasant farms were created against 860 Soviet type solkhoz/kolkhozes before (CFOA, 2003). The allocation of land depended on the available amount of land in the community and the density of the available population (SPOOR, 2005). Both the quality and the category of land were considered. Each family was allocated land from each category and quality.

The overall number of the plots depended on the family size. A family of three received one parcel, families from four to six two parcels and families of seven and more members, three parcels of land (VARDANYAN and GRIGORYAN, 2005). The average size of land per family is 1.3-1.4 hectares, however may differ from region to region (SPOOR, 2005). However, parcels are small and often allocated far from each other that make cultivation of land very difficult. Access to land, including land ownership and use are regulated by following legislation (SAHAKYAN, 2002: P. 52).

The *Constitution of Armenia*, adopted in 1995, recognises and protects the right to ownership of land and other real property. It guarantees the free development and equal protection of all forms of property including land and real estate. However, under exceptional circumstances the Constitution provides the State with the power to acquire private property for public purposes. This acquisition should be implemented by compensation to the owner.

The new *Civil Code of Armenia*, 1999, abolishes outdated rules governing private commerce and property, encourages free market activities and guarantees individual property rights. It regulates the relationship to land and contains provisions on ownership, use, preservation of and control over the land. It promotes the

securing the conditions for free development of all forms and ownership for all subjects of ownership on the basis of multiple forms of economic activities as well as ensuring legality in land relations.

The *Law on the State Registration of Rights to Property,* adopted in 1999, regulates the principles of state registration, the system of state registration; implementation of state registration, its peculiarities and terms.

In 2001, a new *Land Code* was adopted in the Republic of Armenia to support further land reforms. The Law comprises:

- The responsibilities in the field of land administration between the Cadastral Committee, other state and local authorities;

- The communities are responsible for land management issues;

- The state-owned lands will be passed in to communities in two years period;

- The alienation of state-owned lands will be implemented mainly through public bargains, according to confirmed project documents;

- The problems with privatised and recent obtained land parcels, to be used for public and production purposes, found their solutions in institutional arrangements in national, local and private level

Armenia has a mass valuation system of property. The legal basis for land and real property valuation is found in the Law on Land Tax and the Law on Real Property Tax. Land and buildings taxed separately in Armenia.

3.1.2 Rural poverty

Poverty[8] generally is higher in more remote mountainous areas of the country (see Table 2). Poor infrastructure, not favourable agro climatic conditions are some of the factors contributing to the poverty risk. More than 25 % of Armenia's 915 registered communities are rural villages located at elevations of 1800m and higher, accordingly rural poverty is a significant issue (WORLD BANK, 2005).

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[8] "The poor are defined as those household whose per capita consumer expenditure is lower than the national poverty line. The extreme poor are those household whose per capita consumer expenditure is lower than the minimum food line. According to the 1996 national poverty survey, the national poverty line is defined at 10,784.2 Armenian Drams per capita monthly expenditures and includes expenses for food and other basic non – food needs. The food line is defined at 6,612.3 Armenian Drams per capita monthly expenditures and is based on a food basket calculated on the actual consumption of food products (2, 100 kcal diet per day)" KHARATYAN (2003: P. 8).

Table 2: **Poverty in Armenian rural areas by geographic zones, % of population**

Compared to sea level	<= 1300m	1301 – 1700 m	>= 1701m	Total
Poor	42.35 %	54.93 %	57.99 %	50.76 %
Including extreme poor	16.37 %	24.86 %	28.28 %	22.56 %

Source: KHARATYAN (2003: p. 9).

The poverty level is relatively higher in urban than in rural areas (see Table 3). However, this is when not counting Yerevan. Comparing to Yerevan, rural poverty falls much slower.

Table 3: **Poverty rates in Armenia 1999-2003, %**

	Extreme Poverty (below14 USD a month)			Overall Poverty (below 21 USD a month)		
	Incidence	Gap	Severity	Incidence	Gap	Severity
Total						
98/99	26.1 %	5.8 %	1.9 %	56.3 %	17.1 %	7.0 %
2002	17.0 %	3.2 %	1.0 %	49.3 %	12.5 %	4.5 %
2003	5.5 %	0.7 %	0.2 %	32.0 %	5.8 %	1.6 %
Urban						
98/99	32.1 %	7.4 %	2.5 %	58.7 %	18.8 %	7.8 %
2002	18.8 %	3.1 %	1.0 %	45.4 %	11.8 %	4.3 %
2003	6.2 %	0.9 %	0.2 %	30.7 %	5.9 %	1.7 %
Rural						
98/99	18.0 %	3.5 %	1.1 %	47.7 %	13.0 %	4.9 %
2002	14.4 %	2.6 %	0.7 %	44.7 %	11.0 %	3.8 %
2003	4.5 %	0.6 %	0.1 %	33.9 %	5.8 %	1.5 %

Source: Armenia Poverty Profile, 2005 as cited by (WORLD BANK, 2005: p. 22).

Note: Consumption is measured per adult equivalent. Poverty indicators are computed using the 1999 minimum food basket. 1 USD = 380AD. AD = Armenian Drams. USD = United States Dollar.

Income inequality of the population shows a declining trend, though it still stays relatively high. In 2004 the Gini coefficient[9] of income was 0.395 and in 2005 it was 0.36. Consumption inequality is much lower with the Gini coefficient of consumption of 0.26 during 2004-2005 period, WORLD BANK (2007).

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[9] The Gini coefficient is a measure of inequality, with 0 showing complete equality and 1 indicating complete inequality (WORLD BANK, 2007).

3.2 Credit markets in Armenia

With the transformation from a centrally planned to a market economy, an increasing number of local banks were established in Armenia. In a short time, the number of banks reached 74. Till the end of 2000, however, the number reduced to 31. The bank failures were mainly caused by poor management, inadequate supervision and undercapitalisation. In a process private individuals as well as foreign non governmental organisations which entered the market at the beginning of the transformation lost significant funds. The high rate of bankruptcies in the sector has further worsened the livelihood situation of people who saved in banks and has negatively affected societal trust vis-à-vis the entire banking sector.

In 2006 there existed only 21 commercial banks in Armenia (see Table 4). In addition, there operate two leasing companies, around a dozen non deposit taking credit organizations and micro finance institutions.

Table 4:   Commercial banks operating in Armenia and their branches

Commercial banks	Branches	
	31.12.2005	31.12.2006
1 VTB-Armenia Bank	101	98
2 Ardshininvestbank	51	51
3 Armeconombank	39	43
4 Artsakhbank	12	14
5 Converse Bank	16	16
6 ACBA – Credit Agricola Bank	12	16
7 Unibank	17	27
8 Anelik Bank	6	8
9 Areximbank	4	8
10 Inecobank	4	4
11 HSBC Bank Armenia	1	2
12 Prometey Bank	3	2
13 Armimpexbank	–	–
14 Armenian Development Bank	–	–
15 Armbusinessbank	–	1
16 Mellat Bank	–	–
17 Cascade Bank	–	–
18 ITB International Trade Bank	2	4
19 BTA Investbank	1	2
20 Ararat Bank	–	3
21 Armwissbank	–	–
Total	269	299

Source: CENTRAL BANK OF ARMENIA (CBA) (2006: p. 61).

The credit organisations face a problem of limited capital resources. In 2003, overall the total capital of credit organisations was only 1.3 % of total banking assets. The microfinance industry at 2005 was estimated at 11 million USD, with about 30,000 clients (WORLD BANK, 2005).

Large unmet credit demand, especially microcredit demand, exists in the country. The average size of bank loans is small. The annual turnover lies in the range of 2,000-10,000 USD per annum. Donor agencies and microfinance providers, as cited by WORLD BANK (2005) did a survey on the microcredit demand in Armenia. The assessment suggests that there are at least 150-200 thousand potential small-scale clients. The total microcredit demand in Armenia is estimated to be in the range of 40 to 95 million USD annually (WORLD BANK, 2005).

Especially rural areas remain poorly served. Most institutions consider the involvement in rural lending too risky because of their limited understanding of the nature of activities and the type and scope of risks involved. The key difficulties identified in rural lending are the high requirements of loan collateral, the lack of experience of banks with regard to rural lending, the lack of experience of rural clients with regard to borrowing from banks, an extremely low level of bank deposits, and the lack of an agricultural insurance system in the country (MINISTRY OF AGRICULTURE OF ARMENIA, 2002).

3.2.1 Agricultural credit and rural financial markets in Armenia

At the beginning of the 1990s, during the first years of transition, the Government of Armenia continued with the programs of directed agricultural credit. Banks got financial resources to support the operations of state and newly privatized enterprises and farms. These years were the times of high inflation and macroeconomic instability. Thus, the governmental support was a way to support the functioning of the sector. However, those credits were more supply-led and subsidised agricultural credit programs. The inefficiency of such programs became also in Armenia obvious soon. In 1996/1997 the banks had to write off bad loans and recorded substantial loan losses (MINISTRY OF AGRICULTURE OF ARMENIA, 2002).

Soon after, the government stopped those programs of directed agricultural credit. At the same time, Armenian commercial banks refrain from entering the market. The reasoning is that banks lack sufficient loan funds of their own (due to their narrow capital base and limited volume of mobilised deposits) and sufficient experience to finance the agricultural sector with some exceptions of agribusiness activities. Overall, the total lending to the agricultural sector is very limited. In 2003 the total lending to agriculture amounted only 2.5 % of agricultural GDP (WORLD BANK, 2005).

There is only one bank, the Agricultural Cooperative Bank of Armenia (ACBA), which has a notable share of its portfolio in agriculture. ACBA was established,

during the period of 1993-1995, by TACIS[10] program at the Armenian Government's request to allow small farmers organised in village associations to have access to credit. The bank has almost half of its loan portfolio in production agriculture and a portfolio at risk of less than 2 % (WORLD BANK, 2005). ACBA offers small loans to smallholders and small rural businesses. SPOOR (2005: P. 23) gives the following information: Based on ACBA (2003) the bank had 61 % of the total commercial bank portfolio in agriculture. The overall level of lending is very low. In 2003 the agricultural loan portfolio was only 8.8 million USD (or just above 1 % of gross agricultural output (GAO) of the same year). Up to 60 % of ACBA lending activity is in the field of microfinance.

ACBA has established branches in ten marzes and its services cover five hundred villages. It has a client base of about 28,000 (USAID, 2006). All agricultural loans are provided through about 700 formal village credit associations. The association is responsible for the repayment of individual loans. Individuals from the same village wishing to borrow must first join a village credit association. The village leaders make a preliminary assessment of credit worthiness of an applicant. The village leaders' approval, a business plan and a collateral equal to 100 % of the loan are required to proceed with the application. The interest rate for the first time borrowing is 20 % per annum. In some cases, if the association has a good reputation, the interest rate may be lower. After the first successful round, the interest rate may be reduced to 16 %. The average loan term usually is six to eight months. Recently, ACBA offers medium term loans for up to two years.

ACBA and USDA MAP[11] also provide larger loans to agribusinesses. In addition to its own capital of about 7 million USD, ACBA also makes loans to agribusinesses through own lending funds from the World Bank (WB) and International Fund for Agricultural Development (IFAD). The ACBA leasing program provides loans for the purchase of large scale capital equipment for a period up to seven years. The nominal per annum interest rate for this program is 18 %-20 %. The USDA MAP Strategic Lending Program provides both, short and medium term loans, with interest at 15 % per annum. The USDA managed Agro-leasing Limited Liability Company (LLC) leases agri-processing equipment at terms from three to five years, at 8 % interest per annum (KERNAN et al., 2002).

A number of donor agencies have provided additional funds to the Government of Armenia. The funds are meant to support commercial banks for on-lending to agriculture. The subsidiary loan agreements exist between the Ministry of Finance and commercial banks for on-lending to the final borrowers. The Ministry of Finance selects eligible banks (see Table 5) from those banks, which apply for

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[10] TACIS - Technical Aid to Commonwealth of Independent States - promotes the process of democratization and transformation towards market economy in Easter Europe and Central Asian countries.
[11] USDA MAP – United States Department of Agriculture's Marketing Assistance Project in Armenia.

the international loan funds and which meet the standards of the Central Bank of Armenia (MINISTRY OF AGRICULTURE OF ARMENIA, 2002).

Final borrowers are private agri-processing enterprises and farmers. International credit projects are directed towards financing agricultural businesses and farming activities in marzes. This lending has relatively lower interest rates than those normally charged by commercial banks. For example, the per annum interest rate of the loans from HSBC bank's own resources ranges from 18 % to 24 % against 13 % per annum interest rates of the loans under international programs. However, credits are still collateral based. Accordingly, the current outreach to farmers and financing of new agricultural commodities is extremely limited since the potential borrowers can not offer the required collateral such as gold and/or residential property in the capital city Yerevan. Thus, farmers in some extent still depend on their own savings and informal credit, borrowing from friends, relatives and neighbors, as their main source of finance (MINISTRY OF AGRICULTURE OF ARMENIA, 2002; KERNAN et al., 2002). In addition agribusinesses, which depend on farmers for row products provide in kind credit in form of seed and fertilizer to those farmers with whom they work (KERNAN et al., 2002).

In 2003, the loans from commercial banks accounted for only 3 % of the credits from the Government or from financial institutions (WORLD BANK, 2005). Informal credit in 1996 was the source for 25 % of working capital requirements (40,000 Armenian Drams or 100 USD) (LERMAN, 1996).

Table 5:   Loan products of banks under international agricultural development programs

Bank	Product	Min. size in USD	Max. size in USD	Term	Interest	Target Population
Converse Bank	Agricultural Reform Support Program (legal entities)	10,000	50,000	< 5 years	12 %	Agriculture and Food Industry (USD only)
Converse Bank	Agricultural Reform Support Program (farmers)	500	2,000	< 18 months	12 %	Agriculture (USD only)
Ardshininvest Bank	Agricultural Reform Support Program		2,000	1.5 years	18 %	Only to farmers in the regions
HSBC Bank	USDA Marketing Assistance Project	10,000	250,000	< 3 years	13 % fixed rate of the outstanding loan amount	SMEs (food and agricultural). Selection is made by USDA MAP
Anelik Bank	USDA Marketing Assistance Project	5,000	50,000	< 3 years	13 % fixed rate of the outstanding loan amount	SMEs and farmers, USD only. Terms of repayment to be settled by the contract

Source: MEDI (2003, Annex F: F1-F12).

Note: SME = small and medium sized enterprise; HSBC = headquartered in London, it is one of the largest banking and financial services organisations in the world.

3.2.2   Microfinance in Armenia

The microfinance sector is relatively new in Armenia. The first microfinance program implemented by Oxfam[12] was in 1995 (see Table 6). Till the end of 1990s, an increasing number of donor organisations opened microfinance facilities in the country. The lending techniques vary, individual versus group guarantee, among participating institutions. At least three microfinance providers (these are Aregak, Kamurj, CARD) practice group guarantee lending. They reach to lower income borrowers in that playing a significant role in the country. Generally, the market is segmented with different programs serving different market segments (USAID, 2006). For example, ACBA services are appropriate for commercial farmers and SME agribusinesses which are able to provide collateral. The

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[12] Oxfam is a group of non governmental organisation (NGOs) from three continents working worldwide to fight poverty and injustices. CARD is the Center for Agribusiness and Rural Development.

interest rates for these groups are relatively low ranging from 16 % to 20 % per annum. Most low income borrowers which are not able to meet collateral requirements form separate market segment. These borrowers usually pay higher interest rates 28 % to 39 % per annum. The loans are provided under group guarantee condition and are collateral free. Aregak and Kamurj loans are such example. USDA MAP Credit Clubs NGO (and a successor NGO agency CARD) serves small scale pre commercial farmers who are linked directly with processors that are the part of the USDA MAP program. The lending is made based on joint liability criteria. The nominal interest rate of CARD lending is 10 % per annum. Aniv microfinance provider is specialised on individual agricultural credit for SMEs with no access to commercial credit. The nominal interest rate of Aniv lending is 12 % per annum (see Table 7).

Table 6:   Microfinance providers in Armenia

Provider	Organisation Status	Year Lunched	Sector
Aregak Program of UMCOR Armenia	Established by Foreign NGO	1997	Trade, Agribusiness
Kamurj Started by Save the Children and Catolic Relief Services	Established by Foreign NGO	2000	Trade
FINCA Foundation for International Community Assistance	Established by Foreign NGO	2000	Trade
SEF Small Enterprise Fund Started by World Vision	Commercial For Profit Company	1998	Trade, Agribusiness
Horizon formerly Oxfam	Established by Foreign NGO	1995	Trade, Agribusiness
GAF German-Armenian Fund	Bilateral Donor Agreement Program	1999	Trade, Manufacturing
Agricultural Cooperative Bank of Armenia	Cooperative Bank	1998	Agribusiness
IOM International Organisation for Migration	Established by Foreign NGO	1997	Trade
ECLOF Ecumenical Church Loan Fund	Established by Foreign NGO	1998	Agribusiness, Trade
WCC World Council of Churches	Established by Foreign NGO	1997	Agribusiness
Aniv Capitalised by IFAD	Local NGO with no Foreign Affiliation	2000	Agribusiness

Source: Alpha Plus Consulting (2001), as cited by Planet Rating transparency for Microfinance Development (2003: p. 32).

Different programs have different terms and requirements in relation to business plan and collateral. Aniv borrowers, for example, must submit a business plan and provide collateral. The collateral requirements are high and amount to 200 % of the loan (see Table 8). Loans are provided from one to three years duration. The USDA MAP program provides short term loans with the term of one year and less. All borrowers need to be member of village credit clubs. The lending is made to the group (credit clubs) usually 15 to 20 people under joint liability condition. In addition, the business plan for each member is required. The nominal interest rate for credit club loan is 10 % per annum. According to USAID (2006) calculations of interest rate is as follows. The members do not make formal interest payments but receive only 85 % of the required loan amount. The remaining 15 % is divided as follows.

- 4 % is paid into an individual capital fund, which remains on the account of the borrowers but used by the credit club as a part of its loan pool,

- 5 % is paid into a joint capital reserve fund which remains the property of the credit club and is part of the loan pool,

- 2 % is paid into the joint risk reserve fund that is not part of the loan pool, and

- 3 % is paid to CARD to cover servicing of the Credit Club loans including training.

Thus, the program is a unique form of a commercialised grant. The credit clubs are registered as legal credit organisations with the Ministry of Finance and are subject to regular audits.

Table 7:   Selected indicators of financial institutions providing credit to the Armenian agriculture and agribusiness sector

Financial Institution	Staff Number	Borrowers Number	Average Loan Balance USD	Gross Portfolio USD'000	Borrowers per Staff Number	Cost per Borrower USD	Nominal Interest Rate % p.a.
Aregak	123	17,614	326	5,747	143	140	28-39
Kamurj	76	6,536	317	2,075	86	97	28-39
SEF	34	1,686	667	1,142	50	278	28-39
Aniv	19	174	7,036	1,224	9	787	12
Agricultural Cooperative Bank (ACBA)	223	28,292	1,193	3,3762	127	131	16-20
CARD Credit Clubs	3	969	1,709	1,656	323	51	10

Source: USAID (2006: p. 52).

Non-profit microfinance institutions (MFIs) have a much stronger position in the market than the others. They serve over 82 % of the known borrowers. The consolidated outstanding portfolio of the three largest MFIs accounts for 72 % of the total portfolio outstanding of the seven main MFI (these are Aregak, FINCA Armenia, MDF-Kamurj, SEF-ARM International, Aniv Fund, ECLOF – ARM and Horizon Fund) (DALYAN and GRAHAM, 2006).

Compared to commercial banks, the loan portfolio of microfinance intermediaries grew faster, nevertheless, just on a relative scale. Between 2001 and 2003, commercial banks' loan portfolio grew by 13 % and the portfolio in the microfinance sector grew by 52 %. However MFIs invest 50.5 % of their total portfolio in trade. Still compared to commercial banks, they have also a significant percentage in agriculture (34.3 %). The market is not fairly distributed among participating MFIs. There is a fair degree of concentration, with one MFI (Aregak) possessing about 40 % to 45 % of the market share (WORLD BANK, 2005; USAID, 2006). "MFI's clients seek loans to serve one or the combination of the following needs: 1. working capital to sustain crop cultivation and animal breeding cycles; 2. small investments and/or operating capital for retail business operations and small trading concerns; and 3. Supplementary liquidity to smooth family consumption needs" (WORLD BANK, 2005: P. 24).

**Table 8:   Loan products of selected non-bank financial institutions**

NBFI	Product	Min. size in USD…	Max. size in USD…	Term in Years	Note
ECLOF	Group guaranteed agricultural loans	500	Depends on business plan	< 1	At least 3 farmers needed in the group
Aniv	Technical assistance and loans to rural enterprises	2,000	15,000	< 3	Collateral should be 200 % of the loan. Immovable and/or movable property
Aregak	Agricultural loans to women groups	100	Depends on performance	< 1	After every successful phase the loan is increased by 40 %. Collateral free
Kamurj	Group guaranteed agricultural loans	900	1,700	< 1	Min 10 farmers in the group from the same village. Interest is paid monthly. Loans are provided in AMDs.
Izniryan-Eurasia Universal Credit Organisation	Agricultural loans to legal entities only	10,000	125,000	< 4	Collateral should be 150 %-200 % of the loan. Immovable and/or movable property

Source: URUTYAN and ALEKSANDRYAN (2005: p. 14).

Note: AMD = Armenian dram is the monetary unit of Armenia, as of January 2008 (1 USD = 350 AMD), ECLOF = Ecomenical Church Loan Fund; Aniv = Non bank financial institution managed and capitalised by International Fund for Agricultural Development (IFAD); Aregak = Non bank financial institution funded by United Methodist Committee on Relief (UMCOR); Kamurj = Non bank financial institution sponsored and capitalized by Save the Children and Catholic Relief Services.

3.2.3 Institutional size of Armenian MFIs

Compared to other Eastern European and Central Asian (ECA) countries, the operations of Armenian MFIs are relatively small, as defined by the Microfinance Information Exchange. The median gross loan portfolio of Armenian MFIs is more than two times smaller than ECA median (see Figure 6). In respect to individual portfolio size Armenian MFIs differ significantly from each other. The portfolio size of the smallest Armenian MFI is 0.9 million USD which is two third smaller than the ECA median. The largest MFI has portfolio of over 5.5 million USD which is 50 % greater than the ECA median. The loan portfolios of the other five MFIs range from 1 to 3.6 million USD (DALYAN and GRAHAM, 2006). The median age of Armenian MFIs is not much different and is comparable with regional median (see Table 9). The major problem of Armenian MFIs is the lack of market research product development and strategic marketing skills (DALYAN and GRAHAM, 2006).

Figure 6: **Median gross loan portfolio in USD per region**
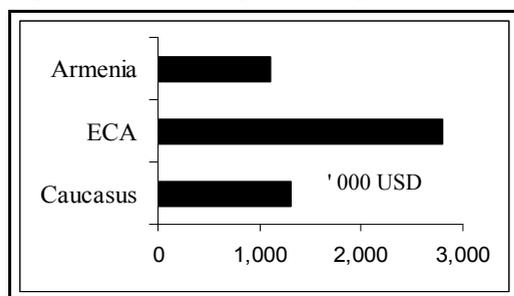
Source: DALYAN and GRAHAM (2006: p. 2).

Note: ECA = Eastern Europe and Central Asia.

Table 9: **Institutional indicators of Armenian, Caucasus and ECA MFIs**

	Institutional Indicators	Armenian MFIs	MBB ECA FSS	MBB All ECA	MBB Caucasus
Number of MFIs	Sample size of group	7	45	60	15
Years of existence	Years functioning as an MFI	5	6	6	6
Gross loan portfolio in USD	Gross loan portfolio, adjusted for standardized write-offs	1,176,731	3,137,182	2,780,486	1,280,770
Offices	Number, including head office	7	8	7	6
Personnel	Total number of employees	34	47	42	41

Source: DALYAN and GRAHAM (2006: p. 2).

Note: ECA = Eastern Europe and Central Asia; MBB = MicroBanking Bulletin; FSS = Financially Self-Sufficient.

3.2.4 Depth of outreach of Armenian MFIs

The medium number of active borrowers of Armenian MFIs is below the ECA median of 3,000 and Caucasus median of over 4,000 (see Table 10). Two out of the three biggest MFIs have more than 6,000 and the third has more than 17,000 active clients. Of the remaining MFIs, one has 2,700 clients and the others have less than 2,000 clients each.

In terms of depth of outreach Armenian MFIs show better performance than Caucasus MFIs (see Figure 7). However, Armenian MFIs are rather diversified. The larger MFIs mainly offer group loans and reach the lower income clients. The smaller MFIs focus on better-off entrepreneurs with individual loans. For example, the depth of outreach ratio in percentage, as measured by average loan size as a percentage of gross national income per capita of the largest MFI is around 30 %. The same ratio of the smallest MFI is around 660 %. Armenian MFIs

mainly operate in densely populated areas with the largest concentration of micro businesses and farms. This leaves entire regions with little or no access to micro-finance services.

Figure 7:   Depth of outreach per region

Source: DALYAN and GRAHAM (2006: p. 3).
Note: ECA = Eastern Europe and Central Asia.

Table 10:   Outreach indicators of Armenian, Caucasus and ECA MFIs

	Outreach Indicators	Armenian MFIs	MBB ECA FSS	MBB All ECA	MBB Caucasus
Number of Active Borrowers	Number of borrower with loans outstanding, adjusted for standardized write – Offs	2,720	4,127	2,884	4,127
Percent of Women Borrowers	Number of active women borrowers/Adjusted number of active borrower	31,4 %	60.8 %	60.8 %	51.0 %
Average Loan Balance per Borrower	Adjusted gross loan portfolio/Adjusted number of active borrowers	560	1022	1023	345
Average Loan Balance per Borrower/GNP per Capita	Adjusted average loan balance per borrower/ GNP per capita	50.0 %	50.0 %	53.4 %	34.0 %

Source: DALYAN and GRAHAM (2006: p. 3).
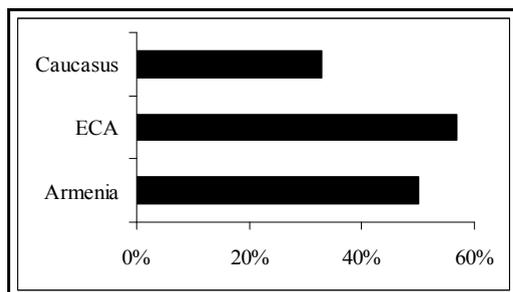Note: ECA = Eastern Europe and Central Asia; MBB = MicroBanking Bulletin; FSS = Financially Self-Sufficient.

3.2.5 Financial structure of Armenian MFIs

Armenian MFIs are primarily donor-funded. They lack of leverage, which is over 60 % lower than the ECA median. Under Armenian law, savings collection by non-bank financial institutions is not permitted. Thus, Armenian MFIs do not mobilize savings and have yet to attract funds from commercial sources. However, the unclear legal status of such institutions prevented the international investors to enter the market. The same time, Armenian commercial banks were

unwilling to lend to them. The capital/asset ratio and other indicators of financial structure of Armenian MFIs in comparison with ECA and Caucasus MFIs are presented in Figure 8. Armeninan MFIs could manage their asset more efficiently by allocating a high portion of their resources to their loan portfolios (DALYAN and GRAHAM, 2006). The current ratio of consolidated gross loan portfolio to total asset of surveyed MFIs is around 83 %. However, Armenian MFIs divert only 17 % of their assets away from their loan portfolios. By doing so they reach fewer clients and generate less revenue (see Table 11).

Figure 8:   Capital/Asset ratio

Source: DALYAN and GRAHAM (2006, p. 4).

Note: ECA = Eastern Europe and Central Asia.

Table 11:   Financial structure of Armenian, ECA and Caucasus MFIs

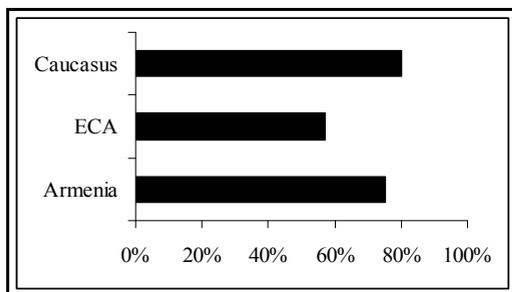|	**Financing Structure**	**Armenian MFIs**	**MBB ECA FSS**	**MBB All ECA**	**MBB Caucasus**
Capital/Asset Ratio	Adjusted Total Equity/Adjusted Total Assets	76.7 %	39.1 %	56.0 %	81.0 %
Commercial Funding Liabilities Ratio	All liabilities with market price/Adjusted Gross Loan Portfolio	0.0 %	22.8 %	14.6 %	0.0 %
Debt/Equity Ratio	Adjusted Total Liability/Adjusted Total Equity	30.3 %	155.6 %	78.6 %	23.4 %
Gross Loan Portfolio/Total assets	Adjusted Gross Loan Portfolio/Adjusted Total Assets	83.4 %	88.0 %	87.4 %	83.4 %

Source: DALYAN and GRAHAM (2006, p. 4).

Note: ECA = Eastern Europe and Central Asia; MBB = MicroBanking Bulletin; FSS = Financially Self-Sufficient.

3.2.6 The regulatory framework for microfinance in Armenia

Till recently, one of the major obstacles of microfinance development in Armenia was the unclear legal status of non-profit microfinance providers in the country. Most of them were established till the end of 1990s with the support of donor and charitable organizations as NGOs and operated under the legal status of foundations. After the acceptance of the Law of the Republic of Armenia on credit organizations adopted on May 29, 2002, the foundations faced notable legal problems connected with the legality of their activities. This law did not permit foundations to be licensed as credit organizations and did not free them from licensing requirements (HARUTYUNYAN, 2005). The Regulation on Credit Organisations, CBA Regulation No. 13 was accepted in 2005. The Central Bank of Armenia and the Ministry of Finance of Armenia required all foundations and/or international organizations carrying out similar activities to obtain licenses till March 1 of 2006. All of them needed to register as financial institutions with the Central Bank as Armenian financial institutions. Thus, in order to be able to continue their activities, foundations had first to form themselves as limited liability companies, joint stock companies, or commercial or non-commercial cooperatives and then apply for licenses to CBA.

Agricultural Credit Clubs fall under and started to operate according to the law of the Republic of Armenia on agricultural credit clubs adopted on April 30, 2002.

Changes of the Law of Credit Organisations have led to additional credit organisations entering the market which created more intense competition. The law and the respective regulation improved the overall environment for microfinance institutions and supported their integration to the entire financial sector of the country. Moreover, it allowed Foundations to be integrated into and regulated with the rest of non depositary institutions engaged in lending activities. Furthermore, it enabled microfinance institutions to search for additional financial sources such as commercial sources of debt and equity.

4 THE CONCEPT OF SOCIAL NETWORK ANALYSIS AS A RESEARCH METHOD AND THE PRESENTATION OF THE LOGIT MODEL

4.1 The concept of social network analysis

Social network analysis (SNA) is a structural analysis of a social network. A social network consists of a set of individuals connected to each other with concrete social relations (WELLMAN, 1988; BOISSEVAIN, 1979). Social relations can be thought of as dyadic attributes of networks such as kinship against the monadic attributes of individuals such as age and sex. Network analysis views circles of individuals as "scattering of points connected by lines that form network. It asks questions about who is linked to whom, the content of the linkages, the pattern they form, the relation between the pattern and behaviour, and the relation between the pattern and other social factors" (BOISSEVAIN, 1979: P. 392).

Network analysis is widely accepted and used as an analytical tool in social sciences. The theoretical assumptions for SNA come from exchange and transaction cost theories. By looking at the linkages and inter-linkages, the network approach makes it possible to understand and analyse the nature of social interactions between people who have different access to resources and power. Moreover, it provides the opportunity to relate everyday experiences of interpersonal relations to institutions which often are manipulated by their participants (BOISSEVAIN, 1979). Thus, "the fundamental difference between a social network explanations and non-network explanations of the process is the inclusion of the concepts and information on relationships among the units in the study. Standard social science perspectives usually ignore the relational information" (WASSERMAN and FAUST, 1994: PP. 6-7). In addition to relational information, social network data may contain attribute variables such as age, gender, race, socio economic status of network members.

4.1.1 Types of network analysis

There exist two basic types of network analysis, complete and ego (personal). In both cases, before collecting the data, boundaries for network size have to be defined. Complete network data requires information about the ties between all pairs of respondents in the network. It aims to give a complete picture of the relations in the network and of the typology of the network. Most of SNA calculations, such as centrality and subgroup analysis, require and are based on complete networks. The challenge to collect complete network data is that it may be very expensive and difficult to obtain (as all the members of the network have to be surveyed).

For this reason, respondents often are asked to name only a limited number of individuals that may be relevant to answer a specific research question. An ego (personal) network analysis is rather focused on an individual than on analysing a network as a whole. Ego network analysis can be done in the tradition of a social science survey. The respondents might be sampled randomly and asked about the people they, for example, interact with and about the ties between those people. The people named by an ego may or may not be surveyed. Accordingly, the obtained information usually is based on a perception of an ego. Ego network data gives a good picture of the local networks of an individual but incomplete information of the general texture of a network as a whole (HANNEMAN and RIDDLE, 2005). Many network measures, as mentioned above, are not applicable for ego network analysis.

Snowball sampling method is often used to identify the network for analysis. This method begins with a focal actor or actors. The focal actors are asked to identify some or all their contacts under specific question. Then all named individuals are asked to do the same. The process continues until no new members are named or until the boundaries set by a researcher are reached. Sometimes it may not be possible to build a complete network starting with a snowball sampling (HANNEMAN and RIDDLE, 2005). In such cases ego network analysis is done.

4.1.2 Sources of network data

Questionnaire surveys, direct observations, interviews, archive records, experiments are the main sources for network data. Two of these techniques, questionnaire surveys and direct observations used for this study, are shortly defined. Questionnaire surveys as data collection method is most appropriate and commonly used when the actors in the study unit are people. Respondents are asked for direct answers in a way so that their answers can be reliably compared (BERNARD, 2002). For example, who they consider a friend, who they ask for help, who they like, etc.

Observations (often called participant or direct observations) usually assume living within the community and participating as fully as possible in a community life (BERNARD, 2002). The researcher systematically observes and records the interactions among people in a variety of social settings and by that gets a sense about the accuracy of the information collected using for example interviews. This method is most appropriate to use when the unit of observation is a relatively small group of people who have face to face interactions (WASSERMAN and FAUST, 1994).

4.1.3 Fundamental concepts in SNA

The basic terminology and the fundamental concepts in SNA are defined by the use of graph theory. The essential components in social networks are: a set of nodes (actors) and arcs (links or ties), a sociogram or graph (created with the nodes and arcs), and sociomatrix (WASSERMAN and FAUST, 1994). "A graph, G=(N,A) consists of the set of N={n1, n2, … ng} nodes corresponding to the individuals,

and the set *A* of *m* arcs representing the ties, relationships, bonds between two individuals" (NEWMAN, 2003, P. 173). The tie can be either directed or undirected. Undirected ties are symmetric, meaning that an arc going from actor *i* to actor *j* is equal to the arc going from actor *j* to actor *i*. In other words, the relationship is symmetric (i,j) = (j,i), (see Graph 1). Directed relations are asymmetric, implying that the relationship might be directed to only one or to both directions (see Graph 2). When the tie runs in both directions, SNA calls it a reciprocated tie. The tie for example between actors *c* and *d* are reciprocal and actors *a* and *b* have non reciprocal tie.

Graph 1:   Example of undirected ties
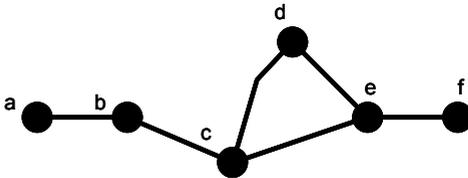
Source: BORGATTI (1994: p. 1).

Graph 2:   Example of directed ties
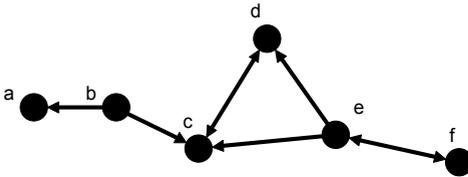
Source: BORGATTI (1994: p. 6).

Most of calculations in network analysis are performed upon a mathematical representation of a sociogram, a sociomatrix. The sociomatrix is a two way matrix, "indexed by the sending actor (the rows) and the receiving actors (the columns) and is equal to the adjacency matrix of a graph when the sociogram captures dichotomous, systemic relationships" (WASSERMAN and FAUST, 1994: P. 77). Graph theorists refer to this matrix as an adjacency matrix because the entries in the matrix indicate whether two nodes are adjacent or not. A sociomatrix is of size *g*g* (g rows and g columns) for one mode network (see Table 12). "A sociomatrix for a dichotomous relation is exactly the adjacency matrix for the graph quantifying the ties between the actors for the relation in question. Although the majority of sociomatric studies focus upon a single relationships analysis, multiple relationships may as well be evaluated" (WASSERMAN and FAUST, 1994: P. 77).

Table 12:   Example of a sociomatrix

	a	b	c	D	e	f
a	0	1	0	0	0	0
b	1	0	1	0	0	0
c	0	1	0	1	1	0
d	0	0	1	0	1	0
e	0	0	1	1	0	1
f	0	0	0	0	1	0

Source: BORGATTI (1994: p. 2).

4.2   Basic measurements in SNA

Density and centrality are some of the most important measurments of SNAs. Density is a widely used concept in graph theory and measures the level of existing ties among the nodes of a graph. It describes the general level of cohesion in a graph. The density of the graph is the ratio of the number of ties to the theoretical maximum number of ties possible. The maximum number of ties is n*(n-1)/2 for an undirected graph and n*(n-1) for a directed graph (HANNEMAN and RIDDLE, 2005).

Centrality measure identifies so called "most important" actors in a social network and shows the extent to which cohesion in a graph (network) is concentrated around the central actors, that is the centralisation of a graph. Centrality calculations are produced at the level of individual actors. The calculation of the centralisation score is performed on a network level that produces value between 0 and 1, which 1 achieved in a graph with star structure and 0 for a complete graph, see Graph 3 3(a) and 3(b). Centrality analysis makes it possible to identify marginal nodes, which have low centrality scores (SCOTT, 2000).

Graph 3: Illustrative networks for the study of centrality
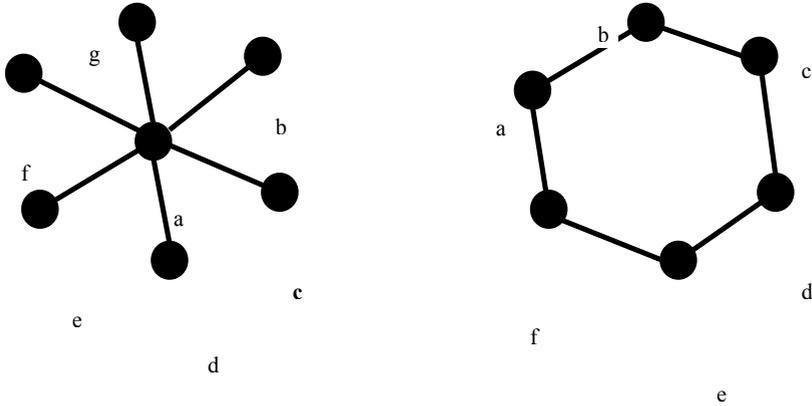
(a) Star network

(b) Circle network
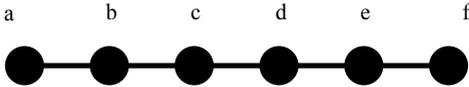
(c) Line network

Source: WASSERMAN and FAUST (1994: p. 171).

Accordingly, for each actor in a network there are two types of degree centrality measures, local and global. The local centrality measure shows how many connections a given actor has. In directed graphs, one calculates in (the ties received) and out (the ties sent) degree centrality measures. According to FREEMAN (1980), the global centrality is calculated in terms of geodesics distance (shortest distance between nodes (actors)). Those nodes, whose sums of geodesic distances to all other nodes are the smallest, are globally centred. The second measure of node centrality is its betweeness centrality score. It can be seen as how far the node acts as intermediary in a network. "Betweeness is, perhaps, the most complex of the measures of centrality to calculate. The betweeness proportion of a point Y for a particular pair of points X and Z is defined as the proportion of geodesics connecting that pair which passes through y it measures the extent to which Y is between X and Z" (SCOTT, 2000: P. 87). In Graph 3 actor a has the highest degree and betweeness centrality measure in a "star network". In a "circle" network the positions of all actors are equal. In a "line network" all the actors are in equal and actor a and actor f in marginal positions.

4.2.1 Problems with network analysis

There are two main problems that the field of network analysis faces. The first problem is that the network data violates the assumption of independence (random sampling) used in other statistical tests. This makes it difficult to test the hypotheses statistically. However, with the development of permutation tests, it is much less of a problem today. Many SNA calculation techniques, such as Quadratic Assignment Procedure (QAP) correlation and QAP regression rely upon permutation tests (SIMPSON, 2001).

The second problem is the lack of appropriate computer software to aggregate and process large datasets. This makes sometimes a researcher to put artificial boundaries for a network size.

4.2.2 Software for SNA

There exist several SNA software packages. The most commonly used ones are UCINET, Pajek, NetMiner II, STRUCTURE, MultiNet, and StOCNET (HUISMAN and VAN DUIJN, 2003). The program UCINET 6.0 (VERSION 6.05; BORGATTI, EVERTT, and FREEMAN, 2002), used in this work; is discussed in more details. This is the best known, most frequently used and user friendly software package for the analysis of social network data. UCINET is a menu-driven Windows program. It has matrix oriented structure, which means that the data sets are collections of one or more matrices. An UCINET dataset can be created either by entering data directly in a spreadsheet or by importing it. It is possible to import datasets in different formats such as data in DL format, Excel datasets or data from Pajek[13]. A simple DL file is presented in Table 13.

Table 13:   Example of DL files type

0	1	1	0
1	00	1	1
1	1	0	0
0	1	0	0

Source: BORGATTI et al. (2002).
Note: DL n=4 formal = full matrix.

The program contains a large number of network analytical possibilities to perform both descriptive analytical calculations such centrality analysis, ego network analysis as well as statistical modelling such as Quadratic Assignment Procedure (QAP) correlation and regression procedures.

The program also allows a graphical presentation and visualisation of social networks. Though UCINET itself does not contain graphical procedures to visualise networks, it has a speed button to run the NetDraw program (BORGATTI et al., 2002).

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[13] Pajek is a program package for a large network analysis.

NetDraw has advanced graphical properties and is able to read and visualise UCINET files natively (HUISMAN and DUIJN, 2003).

4.3 Logit model

The logit regression is a special case of the generalised linear model. Here the dependent variable is binary. The independent variables can be nominally scaled, ordinal scaled or even metric. If the variables are nominal scaled they normally are recoded into binary ones. Ordinal scaled variables are used like metric ones. Based on AGRESTI (2002: P. 191) this procedure is suggested "when such models fit well" because "the model is simpler and easier to interpret, and tests of the predictor[14] effect are more powerful when it has a single parameter rather than several parameters".

Equation 1: General model for logit regression

$$log it[P(y = 1)] = b_0 + b_1 x_1 + b_2 x_2 + ... + b_p x_p$$

$$log it[P(y = 1)] = ln\ Odds$$

$$Odds = \left(\frac{P(y = 1)}{1 - P(y = 1)} \right)$$

Source: O'CONNELL (2006).

$P(y=1)$ is the probability of success coded with *1* for the dependent variable y, b_0 is the constant term of the regression, b_k ($k=1..p$, p: number of independent variables) are the regression coefficients, and x_k stand for the observed values of the independent variables. The natural logarithm of the *odds* is called the logit of the probability for success. The *odds* are calculated by dividing the probability of success ($y=1$) to the probability of failure, that is 1.0 net of the probability of success.

For ordinary (metric) regression models several assumptions have to be fulfilled. For more information on the various assumptions see HÜBLER (1989) and BERRY (1993). Two main assumptions are:

- the independent variables have to be exogenous (no endogeneity)
- the independent variables have to be linear independent from each other (no multicollinearity).

Additional assumptions refer to the error term of the model. The values of the error term are assumed to be normally distributed with a mean value of zero. Error terms of different observations have to be uncorrelated (no autocorrelation), and the variance of the error term has to be constant (no heteroscedasticity).

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[14] Predictor=independent variable.

Endogeneity occurs when one of the independent variables is influenced from other variables (including the dependent variable) in the model or other non-measured variables in the system under investigation, e.g. the number of household members may be a function of the rural character of the region, ethnicity, and religion. In this case the number of household members' variable should be treated as endogenous.

Endogeneity may be a consequence of measurement error, dynamic regression with autocorrelated error, simultaneity, omitted variables, and sample selection error (GREEN, 2003, PP. 75). Omitted variable bias arises if a variable that is correlated with the explanatory variables is excluded from the model. This omitted variable is thus considered in the error term (KENNEDY, 2003; VERBEEK, 2004). The simultaneity problem (also sometimes called the reflection problem (SOETEVENT, 2006) occurs when explained and explanatory variables affect each other simultaneously. In this case it is difficult to separate the impact that endogenous variable has on explained variable.

Thus, the assumption of the classical linear regression model (CLR) that is the exogeneity of the independent variables is violated (GREEN, 2003). In this case, the danger exists that the coefficients obtained from OLS estimation are biased.

There are different ways to correct for this but "no method can perfectly recover causality from observational data" (GULLICKSON, 2005: P. 2). Two of the mostly used procedures are: fixed effects that are included into the model and simultaneous equation models using instrumental variables. In the first case additional variables are included into the model controlling for a stratification or hierarchy in the sample, e.g. income level of the region, remoteness of the village. A simultaneous equation model "includes several endogenous variables which are simultaneously determined by an interrelated series of equations" (PINDYCK and RUBINFELD, 1991: P. 287). The resulting system of equations is commonly solved by using two stage least squares (2SLS) estimators.

Both methods have their weaknesses. Selected instrumental variables have to be highly correlated with the endogenous variable but not correlated with the dependent variable. In addition, instrumental variables have to be uncorrelated with error term. Such variables in practice are hard to find. For this reason, often so-called weak instruments that are only moderately correlated with the endogenous variable and for which the precondition of no correlation with the dependent variable remains dubious are used. GULLICKSON, (2005) argues that with the use of such instruments the researcher does not solve the problem of endogeneity but shifts the debate from the endogeneity of a variable to the validity of an instrumental variable.

Whether the obtained coefficients under consideration of endogeneity are better estimations than that from an ordinary multiple regression model remains

questionable. Therefore, often different procedures are used and the results are compared (JANSEN et al., 2006).

For logit regression models an additional problem occurs because simultaneous equation models are solved using two stage least squares (2SLS) estimator and therefore ordinary least squares (OLS) procedure is applied. This procedure has strong preconditions with respect to normality, heteroscedasticity, and autocorrelation that are not fulfilled in models with binary response variables. Due to the limitations of the estimation procedures for endogenous variables (identification of instrumental variables and inconsistent results) the statistically well-founded procedure of logit regression using ML estimator is used. In respect to endogeneity problem BERRY (1993: P. 8) states

"Instead of worrying about whether our regression models conform to some hypothetical 'true'[15] model – which we never will know – we ought to judge our regression models by whether they conform our theories, and thus whether they can be used to answer our research questions."

The potential endogenously of independent variables in studying social capital effects in regression analysis has been widely discussed in academic literature (MANSKI, 1993; DURLAUF and FAFCHAMPS, 2005). The main debate is around the argument that the casual relationship between social capital and economic outcome variables is difficult to distinguish. Thus, econometric models which analyse social capital effects on economic outcomes may fail to do so and may draw wrong conclusions. The data on social capital indicators obtained in field survey may be dependent on latent characteristics of individuals or households. Thus, the impact of social capital is hard to measure.

To avoid multicollinearity in the model two variables will be considered to be correlated when their pair-wise correlation coefficient exceeds 0.57. In this case the variables which cause correlations larger than 0.57 will be excluded from the model. The pair -wise correlation of variables up to 0.8 is an acceptable limit in statistical models (HÜBLER, 1989). Only two of the variables which are loan circle (L_C) and level of trust in the group (T_GM) are correlated on 0.57 level. The correlation of all the other variables is under 0.5. The model was checked for its stability by excluding (L_C) variable and recalculating the logit regression.

In the range of available data, it was not possible to find appropriate instruments to include in the model used in this work. The author is aware of the methodological weaknesses the model may suffer and is open to possible comments and suggestions of the ways how to improve it.

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[15] A "true" model "can be viewed as the model that completely describes the process determining the value of the dependent variable for any case in the population, thus the equation reflecting the true model would include *all* variables that have an effect on the dependent variable, and accurately reflect the nature of all these effects" (BERRY, 1993, P. 6-7).

The calculation, in this work, will start with the full model including all potential dependent variables. This full model will be stepwise reduced by excluding non-significant variables from the model. This is the procedure that most statisticians prefer (AGRESTI, 2002). The reduction process will stop when only significant variables are left in the model. A variable is considered to be significant when its significance level is lower or equal than 0.05.

5 RESEARCH METHODOLOGY

5.1 Methodology and sample

Primary data was collected in the beginning of 2006 in five villages of Ararat, Armavir, Vayots Dsor provinces in the southern part of Armenia (see Appendix 1). The data set consists of two types: that is social network data and standard socio-economic data. Social network data was collected only in Armavir province of Armenia among 33 private farmers (14 of which are identified to belong to the same joint liability credit group). The sample for network analysis was determined by the snowball sampling method, which begins with a focal actor. In this case, it was the leader of one of the credit groups in the community. The credit group was chosen randomly[16]. The joint liability group members that is 14 farm household of the network sample together with five other randomly selected joint liability credit groups (overall 86 individual group members) in Ararat, Armavir and Vayots Dzor provinces participated in a structured survey to collect socio-economic data.

Though communities were friendly and have had extensive experience with different development programs and projects, they were not open to the idea of being the units of a research study. It was not easy in the beginning to create a comfortable research environment. An advantage was that the primary researcher was of Armenian nationality and able to speak the local language and familiar with the culture. In addition, the development project staff[17] was supportive in introducing the primary researcher to the local people. The combination of both made it possible to establish a basic foundation of trust to conduct the research. During the course of the research, people got more open and shared their perspective about how the community functions, which types of social interactions exist in the village and which changes of social structures and social support networks took place after the transition. The records of the discussions are included in the section of results as ethnological results (see Section 6.1).

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[16] The names of known credit groups coded from 1 to 4 were entered into SPSS program, with the use of random selection command the group under the study was chosen.

[17] The name of the project and the credit groups is known to the authors; bit the interviewed groups as well as the project staff asked to stay anonymous. The aim of this work is not to evaluate the very project but to understand how such credit groups are formed and function in the studied region of Armenia.

5.1.1 Selection of the study area

The Ararat, Armavir, and the Vayots Dsor provinces in the southern part of Armenia were selected for two main reasons. First, in all three provinces, the agricultural sector plays a crucial role for the welfare of the people. Subsequently, access agricultural credit is important to get ahead. In fact, the total volume of the Marz economy is based on agricultural production. The majority of province residents are peasant farmers, in Ararat province 70.9 %, in Armavir province 64.2 % and in Vayots Dsor province 65.6 %. They are involved in cattle breading, they cultivate vine, fruits, and vegetables (NSS, 2004).

Second, there is a high concentration of on-going microfinance projects directed towards agricultural development and poverty reduction in these regions. In fact, five out of six most known microfinance providers[18] have had projects in some of these provinces in 2005. At least four of them, ACBA, FINCA, USDA MAP and Kamurj, practice joint liability group lending. For the discussion on terms and requirements in relation to business plan, collateral and interest rates see Section 3.2.

5.1.2 Network data collection

The data for network analysis were collected in 2006 in Armavir province of Armenia in two fieldwork phases. The first phase aimed at identifying the networks and the network members of the credit group leader. The second fieldwork phase was used to collect relational information. The sample was determined by snowball sampling method. JANSEN (2003) calls snowball sampling a "more realistic way" of data collection, as the researcher does not choose a network based on some assumptions or indicators but identifies a sample based on respondents' perception about who belongs to the network in the scope of a research interest.

The snowball sampling began with a focal actor, namely the leader of one of credit groups in Armavir province. The credit group was selected randomly. The network size was determined by three conditions:

(1) include those actors that are connected to the particular network and are credit group members,

(2) include those actors that are named by credit group members of the network but are not credit group members, and

(3) include actors named by network members not being a member of the credit group.

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[18] These are ACBA, FINCA, USDA MAP, SEF, and Aregak, Kamurj. ACBA is the Agricultural Cooperative Bank of Armenia Credit Agricola, FINCA is the Foundation for International Community Assistance, USDA MAP is the United States Department of Agriculture Marketing Assistance Project, SEF is the Small Enterprise Fund, Aregak is the United Methodist Committee of Relief's Microcredit program, and Kamurj, which means "bridge" in Armenian formed from the merger of Catholic Relief Service and Save the Children microfinance programs.

This way an attempt was made to portray the network as completely as possible. The identification of the network began with asking the credit group leader to name the individuals in the village whom he considers part of his personal network and whom he meets regularly, at least once a week. There was no limitation put on the number of individuals he (as well the other members) could name. Eight members (which constitute the general network as well as credit group members) were identified in this first step and contacted. They were approached and posed the same question. This procedure continued as long as one of the three conditions was met: either the persons named were credit group members, or they were named by credit group members, or they were named by persons who had been named by credit group members. After those people who were not credit group members were contacted to name the persons they regularly met, the snowball sampling procedure was stopped.

Graph 4 presents the sampled network. The member 1 on the Graph 4 is our focal actor that is one of the credit group leaders in the community. The actors who he identified, the square signs in Graph 4, form the second zone members of the network. The actors identified by the second zone members, triangle signs on the Graph 4, form the third zone members of the network. The actors identified by the third zone members, circle signs in Graph 4, form the fourth zone members of the network. The fourth zone members were not asked to identify further network members. The actual size of the network, 33 members – 14 of which were identified to belong to the same credit group – was smaller than initially expected. The reason was that different network members often mentioned the same people as being part of their close network. For the simplicity, Graph 4 presents each of the network members with only one tie. The full ties are presented on the Graph 5.

Graph 4:   Four zone network of the credit group leader
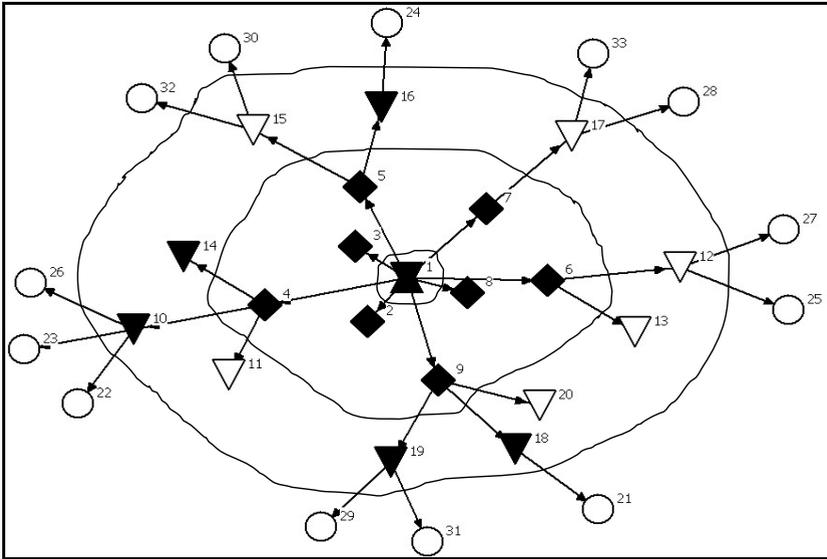
Source: Own presentation, Data collected in 2006.

Note: Names are excluded from the list. The credit group members are marked with black. Often each new member of the further zone was named by several previous zone members. For the simplicity of the graph, the ties are included only ones. For the full ties see Graph 5.

The thing sign indicates the focal actor namely the credit group leader. The square signs indicate the first zone members of the network that is the members named by the focal actor. The triangle signs indicate the second zone members of the network that is the actors named by the first zone members. The circle signs indicate the third zone members of the network that is the members named by the second zone actors.

Graph 5:   Four zone network of the credit group leader
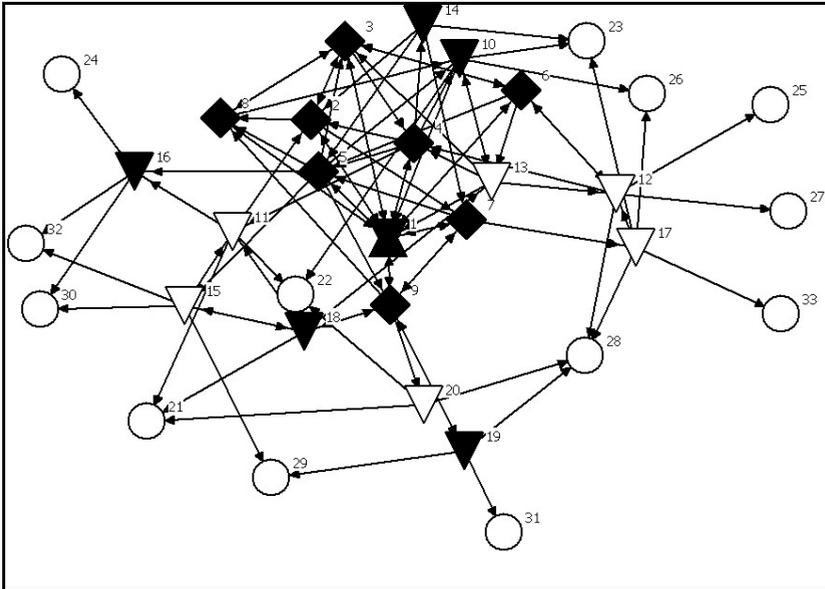
Source: Own presentation, Data collected in 2006.

Note: Names are excluded from the list. The credit group members are marked with black. All ties are included. The thing sign indicates the focal actor namely the credit group leader. The square signs indicate the first zone members of the network that is the members named by the focal actor. The triangle signs indicate the second zone members of the network that is the actors named by the first zone members. The circle signs indicate the third zone members of the network that is the members named by the second zone actors.

After the network had been established, data was collected on bridging social capital of its members. Two associations, which are a production cooperative and a political party, were identified to play an active role in the community in "connecting people to the outside world" (the statements made during qualitative interviews). Accordingly, in the scope of this study, memberships to these two associations are considered as indicators of bridging social capital of network members. Each of the members was asked to answer with "yes" or "no" to the following questions

1. Are you a member of existing production cooperative in the village?
2. Are you a member of existing political party in the village?

The affirmative answers were coded with one and the negative answers with zero. In addition, data was collected on communication, family ties, lending and labor sharing relations in the network. The degree to which extent the studied

network is connected by family ties was of special interest as it could explain the degree to which other network relations are made by family ties and if that affected the decision who was included in the credit group.

Each of the members was asked to answer with "yes" or "no" to four following questions:

1.   Do you talk to all other listed members about your farm/off farm activities and/or about possible economic opportunities in the village?

If not, identify the members in the list whom you talk to.

2.   Do you share agricultural labor with all other listed members?

If not, identify the members in the list that you share labor with.

3.   Do you borrow money, in the range of your possibilities, to all other listed members?

If not, identify the members in the list whom you borrow.

4.   Do you have close or extended family relations to all other listed members?

If not, identify the members in the list whom you have relations.

In addition to network data, information was collected on the individual attributes of network members such as sex, age and education.

5.1.3 Standard social science data collection

Prior to the farm household surveys, 86 observations, a standardised questionnaire was designed to collect primary data. The questionnaire was drafted in English then a sample was translated into the local language, namely in Armenian. Before starting the survey, the questionnaire was pre-tested in one of the sampled villages, and thereafter modified to make more suitable. The questionnaire was designed in the way to collect data on seven sets of variables which based on theoretical and empirical literature are believed to influence credit repayment behavior of individual members under joint liability borrowing condition (see Section 6).

5.2 Database management

1. Five matrixes that is communication, labor sharing, lending money, family relations and strength of the ties[19] were created using Microsoft Excel based on the information collected during the network survey (33 observations). Individual attributes of network members were as well entered in Excel program. As all data within UCINET 6 are described as matrixes it was important that the data be entered in Excel as such. The affirmative answers were coded as 1 and negative answers as 0. The data was checked for possible data entry mistakes and corrected

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[19] Strength of the tie matrix is constructed by combining communication, labor sharing, lending money and family relations matrixes.

by referring back to the information recorded. Matrixes then were transferred to UCINET 6 for the network analysis.

2. A databank was created in Excel based on the information collected during the standard social science survey (86 observations). Then, data was examined closely to check for possible mistakes in data entry.

Taking into account that extreme values can sometimes present reality close examination of the particular case had been done before deciding to discard the information. Some data sets contained variables that were not coded in numerical form at the beginning. Categorical variables especially those with binary response attribute such as female versus male were coded as 0 and 1 respectively. The database was transferred into SPSS 17 for the analysis.

5.3   Methods of analysis

UCINET 6 is used for social network analysis (SNA) to identify how social networks are formed and function in the study region of Armenia. Next, descriptive statistics is used to describe the variables in the binary logit model (see Section 6.3.1). Means, frequencies, min, max are calculated to describe the given answers. Finally, the binary logit model was constructed to test empirically the role of both cognitive and structural social capital in explaining the repayment performance of individual members under joint liability borrowing of credit from MFIs.

6 RESULTS AND DISCUSSION

6.1 Ethnological results

It seems that the transition to independence brought not only economic changes, hardship and poverty to the rural landscape in Armenia but also distortions and changes of social structures and social support networks in the rural community. This was first of all preconditioned by the changes of the socio-economic conditions.

As PLATZ (2000) noticed social life and interactions have historically played an integral part in the life of Armenians. Spontaneous visits to relatives, friends and neighbors were an acceptable practice in communities. Intense interdependences among relatives and neighbors have been characteristic both for village as well as for city life and were something uniquely "Armenian". "Nighborship- (harevanutiun) was valuable much like kinship, and it was considered something particular to Armenian society" (PLATZ, 2000: P. 13).

Village life was characterized with even stronger interdependences and exchange among relatives, friends, neighbors and overall community. People kept strong relations with close and extended family members. Nevertheless, the whole community was connected with strong feelings of group belonging and mutual obligation. The villagers described it as "*we were a one big family*". Though the village is not very small, the older family members knew each other very well and often spoke about "*the old good times*" (statements made in qualitative in-depth interviews).

In Soviet times, the regular and spontaneous visits of relatives, friends and neighbors to each others' houses were a part of everyday life and an acceptable practice in the community. Women, who were responsible for preparing food for the family, had always an extra amount of it as the expectation was that at any time a neighbor or a guest might come (PLATZ, 2000). Hospitability and respect was equally reciprocated among villagers. People left their doors open and neighbors could enter each others houses several times a day. Neighbors practically knew about each others life and family situations as good as family members. In case of need, help and support was provided to each other. In important gatherings, such as weddings, all the families in the village were invited. In funerals, every family was present. Income and life situation of people was such that each family could afford to reciprocate hospitability, help and support. It is arguable if all the existing social norms and practices were beneficial or good. However, in this way mutual help and support in the community was

secured. "Informal social networks based on kinship and friendship as well as on diffused personalized relationship provided an important social space for the people in Soviet Armenia" (BABAJANIAN, 2008: P. 1304).

With the transition, the economic and wealth situation of people started to change. An increasing number of families found themselves facing serious livelihood problems with regard to limited food availability and scarcity of other resources. It became difficult for people first of all to meet the reciprocal obligations (PLATZ, 2000). People became more careful in paying unexpected visits to each others houses. The number of regular and spontaneous visits decreased. Social stratification, which was not obvious in Soviet times, became noticeable after the transition. "*We were all equal, there were no reach and poor in our village, there were some better off people but we were as well not worse. Nowadays it became difficult to feel comfortable with everyone in the community*" (statements made in qualitative in-depth interviews).

Slowly, strong community ties and social support networks were modified and the relations among neighbors, friends and families changed. "Extreme poverty has made it difficult for people to co-operate and support each other. Due to extreme material and social deprivation, people are forced to concentrate on their own everyday survival needs…as resources at the disposal of a household were limited, informal assistance prioritized kinship networks" (BABAJANIAN, 2008, P. 1305).

Respondents stated that generalized reciprocity is still practiced in the community. "*We help each other with what we can but the support is normally only for small things, for instance borrowing limited cash, lending or donating small amount of food, fertilizer or providing labor assistance…..we live in a peace with our neighbors, this is important for us, but the support of our kin members nowadays became a priority*" (statements made in qualitative in-depth interviews).

This however does not mean that the village culture has completely changed. Still for important celebrations, such as weddings, all families in the village come together. Paradox is that even very poor invest a large amount of money in such celebrations. As the respondents stated "*these are justified and reasonable expenditures which are essential for the villagers to be able to appear in the community without shame. People will talk about it and discuss it in coming days. Who wants to lose the reputations (social reputation)? Better to lose some money than to lose the face*". In addition, "*Many of the issues come up in such gatherings, people talk to each other and share information. Not everyone meets all the others every day. Here we get the opportunity to communicate with whom we want*".

It seems that the village gossip (so-called public opinion) has an institutionalized character which provides the community with the latest information and it enforces the people to behave in an expected manner.

Thus, people invest in such type of gatherings to maintain their social reputation and social status and to establish implicit or explicit contracts for support in a social security and social support networks.

The results of qualitative interviews show that social structures in the community have changed and intense social support networks were narrowed down to family circles. However, the village culture still preserved its main features. How far the survey data supports these statements and which implications it has for development interventions is discussed bellow.

6.2 Network analysis results

6.2.1   Analysis of bridging social capital

Graph 6 visualizes the results of the analysis of bridging social capital of the network members. As it can be seen, eighteen out of thirty three network members belong to the production cooperative. Thirteen of them, marked in black, are as well members of the credit group. Six out of thirty-three network members are the members of the political party[20]. None of the political party member is a member of the credit group.

Graph 6:   Membership to associations as indicator of a bridging social capital
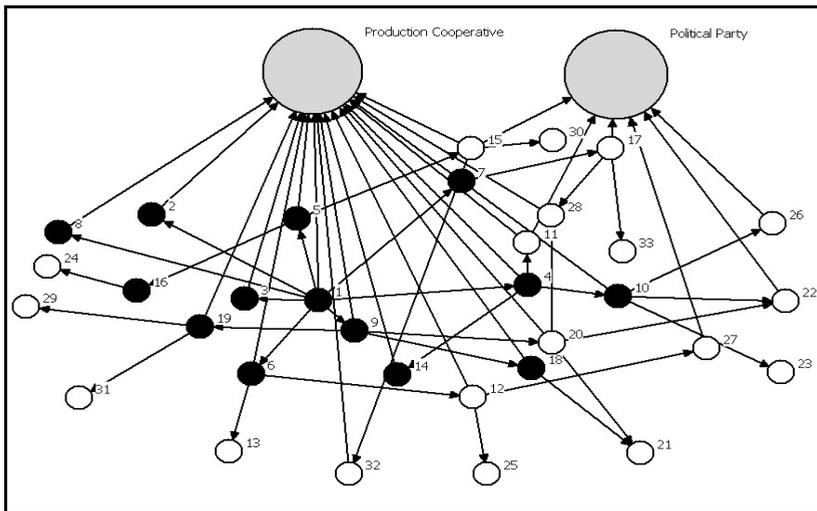
Source: Own presentation. Data collected in 2006.
Note: Names are excluded from the list. Credit group members are marked with solid black circles.

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[20] Political party in this work refers to political oriented groupings in the communities.

To identify if the bridging social capital of individual members has supported their access to the information about upcoming microcredit opportunities to the village, each of the production cooperative and the political party members was asked to answer with "yes" or "no" to the following questions

1. Has the membership to the production cooperative supported you to get information about the existing possibilities of joint liability microcredit in the village?

2. Has the membership to the political party supported you to get information about the existing possibilities of joint liability microcredit in the village?

In the case of an affirmative answer, respondents were asked to explain in which way the membership supported their access to the information.

Only two out of eighteen production cooperative members, member 1 and member 4, stated that they got to know about joint liability lending possibilities through their membership in the production cooperative. All others stated, at some point of time, they heard or got to know about it through their social network. However, it was not directly connected to the membership in the cooperative but rather to the membership in the social network. None of political party members are the members of credit group.

When asked to explain how the membership to the cooperative helped them to get information, member 1 stated:

"*I am one of the founders of the cooperative and the main negotiator of the cooperative. I look for different possibilities that will make our production more efficient and cheap. I as well look for possibilities to improve storage and marketing of our produce….some years ago we applied to this project (which for the moment implements joint liability lending) for financing to build storage and cooling capacity in the village. Unfortunately we did not get it funded. Nevertheless, we got some support in marketing our products..… The staff members know me and they trust me. That is why they contacted me when planning to enter the village with the credit project*" (statements made during qualitative interviews).

Member 4 stated:

"*I used to work for an extension service. I knew many people working in the field of agricultural development. I still have my contacts. I as well know some of staff members in this project. I still deal with them as sometimes I ask for an advice concerning to our cooperative. That is how I got to know about coming joint liability lending opportunities*" (statements made during qualitative interviews). Graph 7 visualises the results.

Graph 7:   Membership to associations as provider of new opportunities
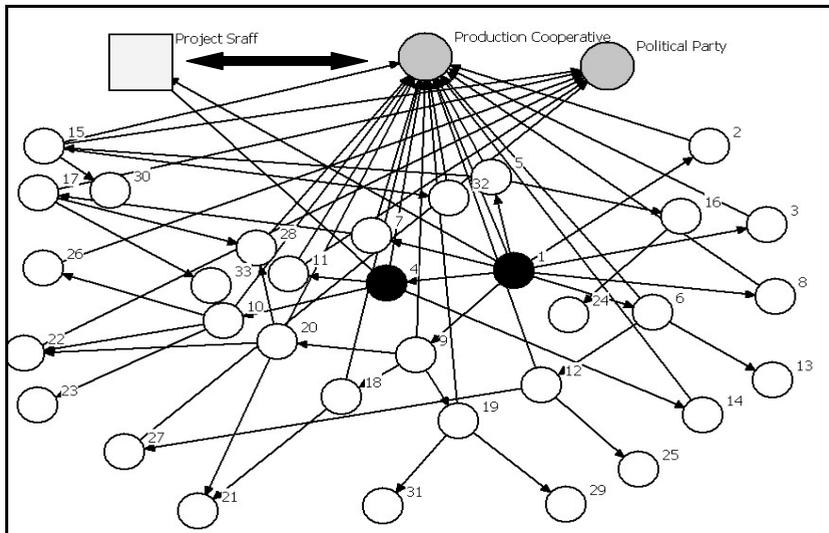
Source: Own presentation. Data collected in 2006.

Note: Names are excluded from the list. Member 1 = main negotiator of cooperative;
         Member 4 = used to work for extension service.

The results indicate that the membership in the production cooperative or the membership in the political party, so called bridging social capital, does not guarantee equal access to information and equal access to new economic opportunities to all its members. Thus, several conclusions can be drawn:

First, the purpose of the association and the type of activities it is involved in may influence the type of information its members have access to. It seems that political oriented associations do not necessarily support information flow related to economic resources in the studied region of Armenia.

Second, different roles and positions of individual members in the association, such as member 1 being a main negotiator of the cooperative, as well as the previous experience and contacts, such as established trust between the project staff members and actors member 1 and 4, seem to provide different members with different type and speed of information. Further research may be useful to look at the pre existing social capital between the individual members of the associations and staff members of the organisation that is implementing the project.

Third, it may well be that there exist several sub-groupings in the production cooperative, meaning that the members in those groupings are connected to each other with pre-existing social relations such as kinship and friendship. This may explain why some of its members are included as well in the credit group and the others are not. In other words, in its internal structure the production

cooperative may be playing rather a bonding role than a bridging one. These conclusions, however, are based on the limited available information and in some extent are rather intuitive.

Hence, further research may look at associations' aims and main function as well as the composition of the membership in respect to both demographic (multiple attributes[21]) and relational (multiple ties[22]) indicators.

It is interesting to look on the existing empirical literature which attempts to rank the associations either according to their aim or according to demographic composition of their members. To the best of our knowledge there are no existing studies to rank the associations according to relational composition of their members.

ZMERLI (2002) identifies the types of associations based on the associations' aims and main activities leaving out the question of diversity and inclusiveness of their members. She argues that pensioners' and women associations play a bonding function. Sport clubs and cultural associations on the other hand have more bridging function. PAXTON (2002) distinguishes between bonding and bridging associations based on the number of external links they have to other associations. She reveals that religious associations, unions and sport associations are bonding groups, meanwhile human rights, peace and environmental associations are bridging groups. COFFÉ and GEYS (2007, P. 122) focusing on the socioeconomic demographic heterogeneity of associations argue that "heterogonous associational membership is likely to be associated with more bridging potential, whereas homogenous associational membership is associated with more bonding potential. That is, when the association brings members into contact with broad sampling of various groups in society (thereby implying heterogeneous membership), the association can be defined as a bridging association. When the association is, on the other hand, narrowly constituted (and its members homogenous), it is likely to be a predominantly bonding association". Using the data from five surveys conducted by the Administration Planning and Statistics (APS) of the Flemish government they found that artistic, humanitarian associations like Red Cross and hobby clubs are predominantly bridging associations while women and retired people associations form predominantly bonding groups.

6.2.2   Analysis of network relations and bonding social capital

To understand how the network functions, we are interested in multiple ties of actors that connect them to the network. This is because the tie and the position of an actor in one relationship may reinforce or constrain the tie and the position in another relationship. Of special interest is the number of existing family ties

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[21]   Demographic indicators (multiple attributes) are, for example, age, gender, education, profession of group members.

[22]   Relational indicators (multiple ties) are, for example, existing kinship, friendship, religious ties among group members.

in the network and how far other network relations are reinforced or conditioned by family relations. Afterwards, the four relationship ties (family, labor, lending, and communication) are combined together to analyse the tie strength – bonding social capital of network members.

The analysis starts with looking at the size of the network. This may be important as it may give already a rough idea about the network structure and indicate the expected difference between possible and actual number of existing connections. The actual number of connections may vary depending on the network size. The bigger the network is, the fewer are the expected number of actual ties. In any network there exist *k*(k-1)* possible unique ordered directed number of ties, where *k* is the number of network members (HANNEMAN and RIDDLE, 2005).

In our case, the complete network consisted of 33 members. The size of the network is not too big. Thus, we may expect most of the network members to know each other and to have well established resource and information exchange relationships.

Figure 9 is based on the results of univariate statistics and demonstrates how the actors in the studied network are related to one another in relation to information exchange, labor exchange, money exchange and family relations networks. It shows, in decreasing order, the percentage of actors to whom the individual actors reported being related. One member in the network recorded sharing information with 44 % of the other members. Twenty-seven percent of the actors share information with fewer than 7 % of the other members. Because they communicate, the word gets round. However, the percentage of direct communication is relatively low. Communication does not necessarily imply labor sharing. Only two members recorded to share labor with 28 % and four members with 25 % of the other members. The cost of sharing labor is obviously higher than of communication, taking into account the fact that it may not necessarily be reciprocated. Lending money to the others is not very common. In fact, only one member has recorded lending to 28 % and two members lending to 19 % of the other members. More than 30 % of the actors do not lend to any other member in the network. Family relations consist of nuclear families and extended family members' cousins and in-laws. With some exceptions, family relations in Armenia imply equally strong ties between the nuclear family and extended family members. With the exception of one person, all network members are connected by family ties.

Thus, the patterns of relations in labour and family networks are quite similar. Lending relations are different for two reasons. First, people are more restrictive in lending as it is a higher risk activity. Second, not everyone has enough capital to lend it out to the others. The pattern of communication is different as well, and shows that some people communicate far beyond their family or labour networks.

Figure 9: **Percentage of actors to whom individual actors report being related to in descending order**
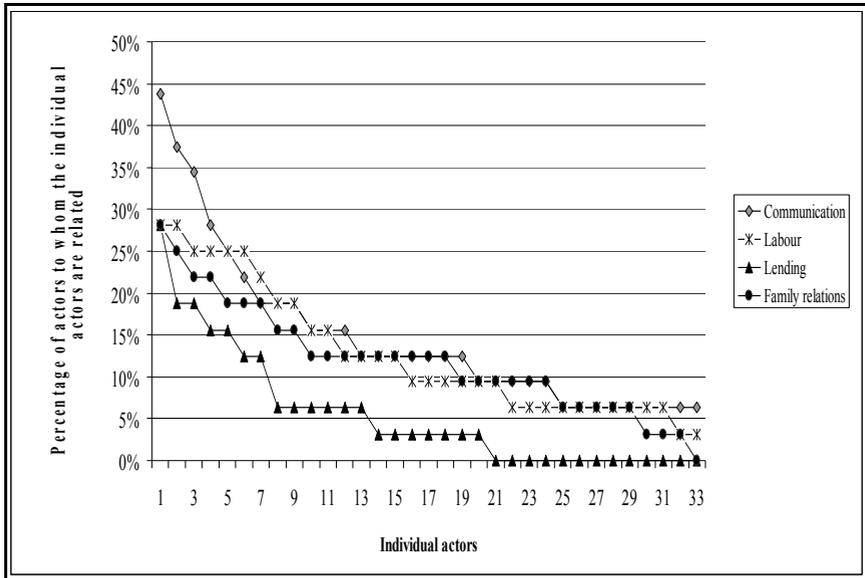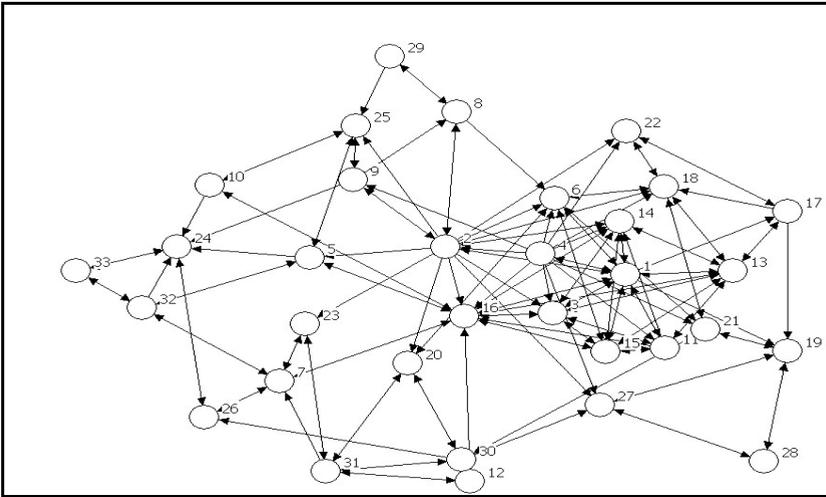

Source: Own calculations. Data collected in 2006.

The observed connections in the network lead us to the question of reachability. Reachability measures the extent to which the actors are connected and if there are any isolated people in the network. According to HANNEMAN and RIDDLE (2005), an actor is reachable by another actor if there is any set of connections by which the connection can be traced from the source to the target actor.

In our case, the reachability analysis of the network members showed that there exist some paths connecting everyone in relation to the flow of information, labor exchange, and the exchange of money, with the one exception of family ties, (see the visual presentations on Graph 8, Graph 9, Graph 10, Graph 11). Graph 12 visualizes the results of combined matrices, in other words the tie strength-bonding social capital in the network.

Graph 8:   Information exchange ties in the studied network

Source: Own presentation. Data collected in 2006.

Graph 9:   Labour ties in the studied network
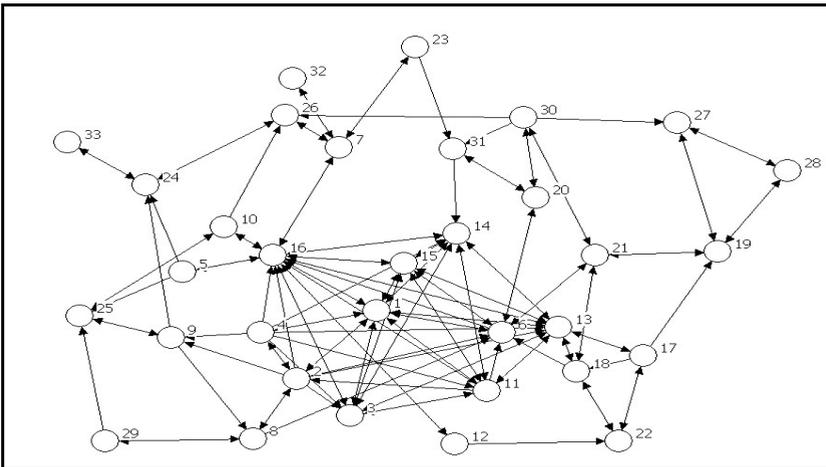
Source: Own presentation. Data collected in 2006.

Graph 10: Lending ties in the studied network
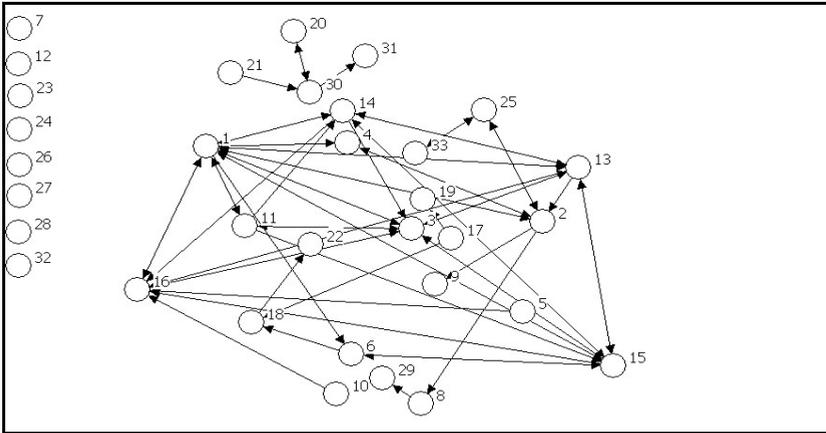
Source: Own presentation. Data collected in 2006.

Graph 11: Family ties in the studied network
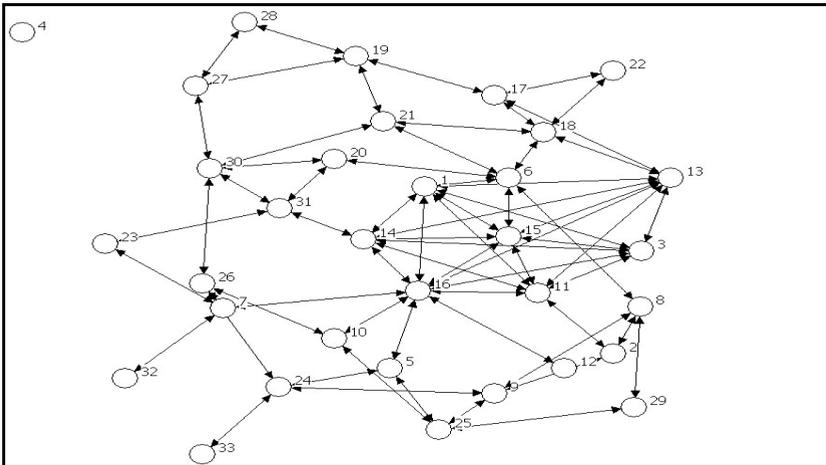
Source: Own presentation. Data collected in 2006.

Graph 12: Tie strength in the studied network
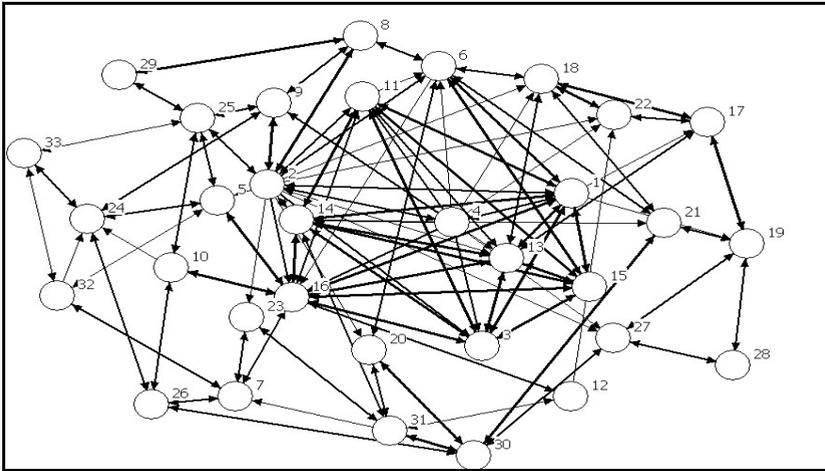
Source: Own presentation. Data collected in 2006.

Knowing that the network is fully connected with three out of four network relations, the densities of network relations are calculated. The density of the network is important as it may give information about such indicators as the speed of information diffusion or the level of cooperation in the network. The density of the network is the proportion of all possible ties that are actually present (HANNEMAN and RIDDLE, 2005).

The maximum number of ties we could have in a fully saturated network of size 33 is 1,056, which would correspond to a density of 100 %. As Table 14 shows, the densities are much lower than the maximum. The low density of communication implies that it takes time for the information to diffuse in the network. The low densities of labor exchange and lending relations show that the intensity of cooperation in the whole network is relatively low. The density of combined relationship ties indicate that almost 45 % of all the tie strengths – bonding social capital are present in the network. However, the calculated standard deviation of 1.1018 suggests that there are actors with many and actors with a few strong tie connections (see Graph 12). Consequently, it may be assumed that the bonding social capital in the network is unevenly distributed and there is differentiation in the network in respect to the amount of help and/or access to resources and new economic opportunities actors have.

Table 14: Densities of information exchange, lending, family relations and tie strength

	Density
Communication	0.1468
Labour force	0.1278
Lending	0.0549
Family Relations	0.1269
Tie strength	0.4564

Source: Own calculation. Data collected in 2006.

Note: $N = 33$.

The question asked is thus: If a pair of actors is connected by family ties, is it probable that they as well exchange information, work together and are involved in monetary exchange, or are there other factors, which play a role?

To test this association and to demonstrate more effectively the relationship patterns occurring among the actors, the Quadratic Assignment Procedure (QAP) for each pair of matrices was applied. The idea of the QAP is to identify the value of the measure of association when there really is not any systemic connection between the two relations. In order to see whether the resulting correlation is significant, QAP relies on a simulation. The QAP algorithm proceeds in two steps. In the first step, the algorithm calculates an initial Pearson r from the input matrices and then compares that with the Pearson r that is obtained when the rows and columns of one of the matrices are randomly permuted many times (in our case 1,000). The p values for QAP correlations are the proportion of times that the initial r is equal to or exceeded by the r from the permutation. As in other significance tests, a proportion 0.05 or less is taken to suggest significant association (HANNEMAN and RIDDLE, 2005; BORGATTI et al., 2002). Table 15 summarises the results of the QAP correlation analysis.

Table 15: Association between the network relations by QAP correlation

	Communication	**Labour**	**Lending**	**Family relations**
Communication	1	.84[***]	.52[***]	.79[***]
Labour		1	.56[***]	.86[***]
Lending			1	.50[***]
Family relations				1

Source: Own calculations. Data collected in 2006.

Note: [***] $p<0.001$.

The matrices are positively correlated. The QAP Pearson correlation between communication and family ties is 0.79 (p<0.001). Between labour and family ties, it is 0.86 (p<0.001) and between lending and family ties, it is 0.50 (p<0.001). The strong correlations suggest that family ties play an important role as the base of social network formation.

The strong correlation between the communication and family relations matrices suggests that the information about new economic opportunities, such as micro-finance opportunities, is mainly communicated in the family network. As the results of QAP correlation indicates, outside the family the speed of information diffusion is lower than within. We may expect that the individuals in advantageous or key structural positions in the network, e.g. community elites, other key players, who may obtain the information about new economic opportunities first, may benefit the most.

Labour and family ties matrices show the highest structural similarity. Thus, labour is extensively shared among close and extended family members where help is equally reciprocated. Shared labour is especially valuable for those with fewer economic resources as they may invest more labour in agricultural production than the others. For those whose livelihood depends mainly upon agriculture, this may be an effective coping strategy (defence) in case one falls behind or becomes ill.

The correlation between lending and family ties matrices is significant but the correlation coefficient is relatively low. It suggests that though network members are more likely to lend to family members than non-members, the intensity of lending is not high. Lending can be a high risk activity. Those lending to each other seem to be connected with a high level of trust-based relations. However, many people lack material resources and are not able to lend to one other. Lending money to family members is another example of a coping strategy (defence) that is developed by people for individual and family survival.

The QAP Pearson correlations between communication and labour of 0.84 (p<0.001), between labour and lending of 0.56 (p<0.001) and between communication and lending of 0.52 (p<0.001) suggest that those who communicate (155 ties) in most cases share as well labour (125 ties). Many of those who communicate and share labour as well lend to each other (51 ties). However, the intensity is relatively low.

In order to make the underlying data transparent, Table 16 and Table 17 cross-tabulate the absolute numbers of family, communication, labour, and lending relations. Table 16 shows how many relations of a given type reported by a given person are also relations of another type reported by the same person. For example, 117 family ties are also communication ties reported by the same persons who also report the family tie. 116 family ties are also labour ties (again, reported by the same person). However, only 47 family ties were reported as lending ties.

Table 17 is organized the same way, but it confronts the ties a given person reported not to other ties the same person reports, but to ties this person *is reported* as having with others. In consequence, the diagonal of Table 16 gives the overall number of family, communication, labour and lending ties in the network, and the diagonal in Table 17 gives the number of reciprocal ties, e.g. ties where the lender is also the recipient of a credit (38).

A first observation these cross-tabulations offer is that both communication and labour sharing are closely connected with family relations. The family obviously defines the circle within which people communicate and help. As we have no genealogical data to check if the interviewees told us all about their kinship relations, also an alternative view is possible, suggesting that kin are better remembered as such if they bother to communicate and help. The diagonal in Table 17 also tells us something about reciprocities. Trivially, family ties, communication, and labour sharing are usually reported from both sides of a relation. This is not surprising because these relations go both sides by definition. But also lending ties are usually reciprocated. Is there a connection between reciprocation and family relations? Table 18 shows that the degree of reciprocity in communication and labour sharing is in fact higher within the family than outside. But in the case of lending, the opposite is true. Lending is more strongly dominated by reciprocity outside the family than within. Lending can be unbalanced within the family, possibly because the family ensures that credit is paid back and/or because the family obliges to help one another even if the help is not immediately reciprocated. In contrast, among non-family only those are trusted who possibly have already given credit to ego or the ego has previous positive experience in lending/borrowing money to/from those members.

Table 16: Cross tabulation of absolute numbers of ties for 33 persons

	Communication ties	Labour ties	Lending ties	Family ties
Communication ties	155	125	53	117
Labour ties	125	135	52	116
Lending ties	53	52	58	47
Family ties	117	116	47	134

Source: Own calculation. Data collected in 2006.

Note: Ties to others reported by interviewed person, versus other ties to the same person reported by interviewed person, overall number of ties in diagonal.

Table 17:   Cross tabulation of absolute numbers of ties for 33 persons

	Communication ties 2	Labour ties 2	Lending ties2	Family ties 2
Communication ties	118	107	50	117
Labour ties	107	104	50	116
Lending ties	50	50	38	47
Family ties	117	116	47	134

Source: Own calculations. Data collected in 2006.

Note: Ties to others reported by interviewed person, versus. ties to the interviewed person reported by other persons, number of reciprocal ties in diagonal.

Table 18:   Family ties and reciprocity

	Family		Non-family	
	N	%	N	%
Ego's communication ties	117	100	38	100
... that are also Alters' communication ties	106	91	12	32
Ego's abour ties	116	100	19	100
... that are also Alters' labour ties	98	84	6	32
Ego's lending ties	47	100	11	100
... that are also Alters' lending ties	28	60	10	91

Source: Own calculations. Data collected in 2006.

6.2.3 Analysis of actors' centrality and network centralisation

The network approach defines actors' power and influence depending on their structural position in a given social network. This is because actor's power is embedded in his/her social relations and is a consequence of patterns of these relations (HANNEMAN and RIDDLE, 2005). To study the centrality and power of different actors this work uses some of the main approaches that is accepted in social network analysis to study power, and which is closely related to the concept of centrality (see Section 4.2).

The analysis starts with looking on information exchange relations and continues with analysing other network relations. The degree, closeness and betweenness centrality scores of individual actors are calculated and compared. Thereafter, the meso level analysis, which is the distribution of actors' degree centrality scores, of four network relations is performed. This gives us the information about whether the studied population is homogeneous or heterogeneous in its structural position. The last part of analyses presents macro level analysis of four network relations, which is the information about how far the whole network is centralised.

Figure 10 shows the top ten members in the information exchange network when their overall number of ties (in-degree and out-degree ties) are considered and Figure 11 presents the relational distribution of out- degree and in- degree ties as percentages of overall number of actors' ties. If the directions of ties are ignored, the actors will differ from each other with the overall number of ties they have. In this case (see Figure 10), the actors 1, 2 and 16 are the most central actors in the information exchange network. However, it is interesting to observe which structural position the actors have in respect to their out-degree and in-degree ties. As HANNEMAN and RIDDLE (2005) state, this may give information about who the most prestigious and prominent members are. The actors who receive many ties may be the most prestigious and prominent members and the actors who send many ties may be the influential members in the network. In this case (see Figure 11), the actors 1, 2, 4, and 16 are the most central ones in respect to their out degree ties. In respect to in-degree ties actors 1 and 16 are the most central members. Actors 2 and 4 have 5 and 1 in-degree ties respectively.

Figure 10: Top ten members' information exchange ties
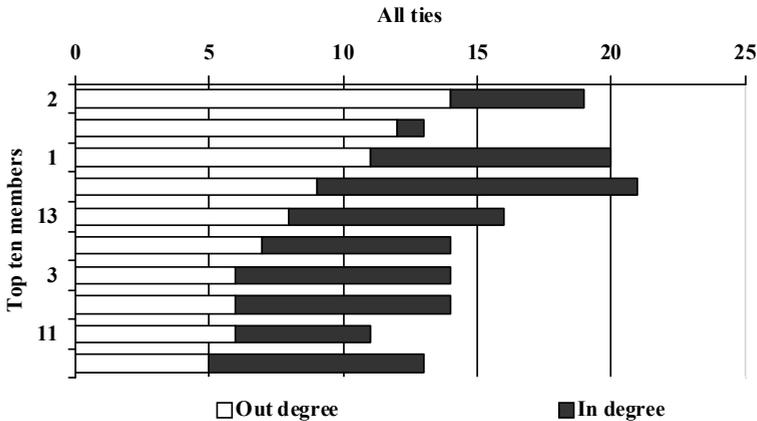
Source: Own calculations. Data collected in 2006.

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Figure 11: Top ten members' information exchange ties as percentages of overall ties
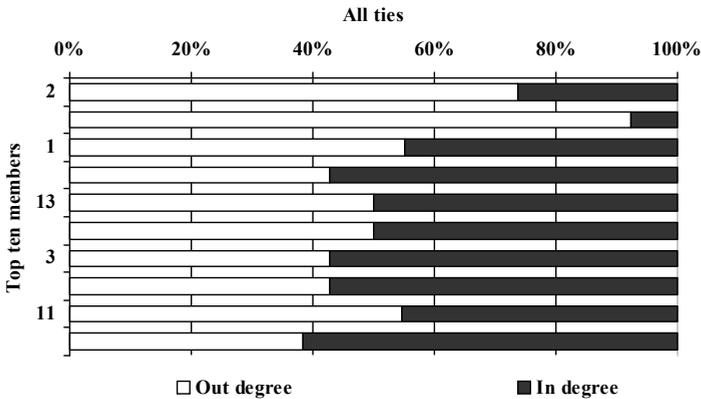
Source: Own calculations. Data collected in 2006

Table 19 presents the information exchange degree centrality scores and the information dissemination index of the top ten members in respect to their information exchange ties. The information dissemination index is adapted, following BAE et al. (2005) and HOSSAIN et al. (2007), to identify the members which play a more active role for the information transfer in the studied network. BAE et al. (2005) used the index to determine which members are more involved in communicating with other members. HOSSAIN et al. (2007) used the index to determine which participants contributed more to the information flow in the cell phone network. The information dissemination index used for this study is defined as follows

Equation 2:   Information dissemination index:

$$IDI = (Ties\ sent - ties\ received)/(ties\ sent + ties\ received)$$

The index is +1 if the network member only sends information but does not receive any. The index is -1, if only receives information but does not send any. The index is 0, if the information send and the information received are balanced (HOSSAIN et al., 2007).

The actors 1, 2 and 4 are the critical members for the information diffusion in the network as they have the highest degree of out degree ties. The actors 1 and 16 seem to have the most favourable position as they have the highest number of in-degree ties, meaning that they get information from different sources. Some of the network members such as actors 13 and 15 occupy rather balanced position, meaning that they have equal number of in-degree and out-degree ties.

In addition to degree centrality scores, closeness and betweeneess centrality scores are calculated. Closeness centrality score shows the distance an actor has to all others in the network by counting the distance from each actor to all others. Farness (see Table 20) is the sum of the distance from each actor to all others in the network. The betweeness centrality score, for the binary data, views an actor as being favored positions if he falls on the geodesic paths between other pairs of actors in the network (HANNEMAN and RIDDLE, 2005).

Table 20 shows that the actors with high closeness and betweenness centrality scores generally agree with their high scores for degree centrality measure. Actors 1, 2, 16 and 4 are the most central actors in respect to their degree and closeness centrality scores. In respect to betweeness centrality score actor 4 is not on the list of the top ten members of the network.

All above mentioned four, the most central, network members are the members of the credit group. Surprisingly, according to his out-degree centrality scores, the credit group leader, which is actor 1, does not occupy the most central position in the information exchange network. Out-degree centrality scores show to how many others in the network the ego sends information. It seems that though the contacts of the credit group leader – bridging social capital provide him with access to a various sources of information (as found in Section 6.2.1) the information transfer in the studied network to a large extend is done by or delegated to the actor 2 and actor 4. The possible explanation could be that the network has internally accepted and informally prescribed roles for its members. As a prominent network member the credit group leader communicates information to a selected number of the others. For the further information transfer the other network members play more active role.

The results of closeness centrality scores support this argument. It shows that the actors 2, 4 and 16 have higher closeness centrality scores than actor 1. This implies that they stay closer to a higher number of others in the network than the credit group leader. Though, he still occupies one of the most central positions.

With regard to the betweeness centrality score, the actor 16 is the most central member in the information exchange network. This is an interesting finding, as actor 16 is a woman. It seems that though not so obvious[23] women play an important role in connecting and keeping the network members together. She stated

"I have five brothers living in the village. I pay regular visits to their houses and make sure that we all stay in a close contact. They in their turn make sure that I feel fine and visit me as often as they can. It is important for them what I think and advice. In other words 'they respect my word'. Their wives behave the same way when it comes to their relatives. It is normal behaviour for most of the families in the village. Even if the husband or often the mother in law is against

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[23] By saying "not so obvious" it is meant that Armenia is still quite a traditional society with clear distinguished roles for men and women. This is especially true for rural settings.

this behaviour, the women try hard not to lose the close contact to their so-called fathers house" (statements made during qualitative interviews).

It seems that the findings of WELLMAN and WORTLEY (1990: P. 582) in Toronto "men fix things and women fix relationships" implies well to the situation of Armenia today. Women obviously play more important role for the emotional contacts and by that promote the provision of the more of instrumental help and support. Thus, the government and international development organisations could more intensively mobilise the "hidden power" of women especially for community based empowerment and bottom up development projects by intensively inte-grating women, women groups especially in a preparation face of such projects. The joint liability based microcredit providers may pay more attention on the desired mixture (women and men) of group composition. Women may play an important role for uniting the group members and for information transfer activities.

Table 19: **Information exchange degree centrality values and dissemination index of the top ten members of the network**

Actor	Out degree	In degree	Total interactions	Dissemination index
2	14	5	19	0.47
4	12	1	13	0.84
1	11	9	20	0.1
16	9	12	21	-0.14
13	8	8	16	0
15	7	7	14	0
3	6	8	14	-0.14
14	6	8	14	-0.14
11	6	5	11	0.09
6	5	8	13	-0.23

Source: Own calculations. Data collected in 2006.

Table 20: **Closeness and betweenness centrality measures for information exchange relations**

Actors	Farness	nCloseness	Actor	Betweeness	nBetweeneess
2	51.000	62.745	16	302.487	30.493
16	56.000	57.143	1	200.587	20.220
4	57.000	56.140	2	173.467	17.487
1	61.000	52.459	7	145.974	14.715
3	65.000	49.231	6	122.455	12.344
5	65.000	49.231	21	119.568	12.053
6	65.000	49.231	13	93.723	9.448
14	65.000	49.231	19	89.790	9.051
9	68.000	47.059	5	72.181	7.276
18	68.000	47.059	30	62.913	6.342

Source: Own calculations. Data collected in 2006.

Note: Betweenness is a measure of the number of times a vertex occurs on a geodesic. The normalized betweenness (nBetweenness) centrality is the betweenness divided by the maximum possible betweenness expressed as a percentage (FREEMAN, 1979).

The question asked is if an actor has central structural position in the network in respect to information exchange relationships, has the same member as well central structural position in respect to labour exchange, money exchange and family relations. Table 21 presents degree centrality values of the top ten members in respect to labour exchange relations and Table 22 gives the information on the closeness and betweenness centrality scores.

Table 21:   Labour degree centrality values of the top ten members of the network

Actor	Out degree	In degree	Total interactions
1	9	9	18
16	9	13	22
11	8	6	14
2	8	4	12
13	8	10	18
4	8	2	10
15	7	7	14
14	6	8	14
3	6	8	14
6	5	8	13

Source: Own calculations. Data collected in 2006.

Actors 1 and 16 (in Table 21) are as well the most central actors in respect to their degree centrality values in labour exchange relations. In respect to the closeness and betweeness centrality scores only actor 16 preserves the most central position. As in information exchange relations, with the highest betweenness centrality score, she intermediates and connects a number of network members to each other by that promotes cooperation and mutual support. This implicitly points on and underlines the importance of women for the success of joint liability based borrowing groups as in such groups it is essential that the group members cooperate and in case of need help each other on agricultural activities.

Table 22:   Closeness and betweenness centrality measures for labour exchange relations

Actors	Farness	Closeness	Actor	Betweeness	nBetweeneess
16	59.000	54.237	16	134.037	27.024
6	64.000	50.000	6	79.582	16.045
13	66.000	48.485	30	57.515	11.596
2	67.000	47.761	7	53.443	10.775
11	70.000	45.714	13	51.167	10.316
1	70.000	45.714	26	49.837	10.048
4	70.000	45.714	24	40.817	8.229
14	71.000	45.070	21	33.467	6.747
15	73.000	43.836	9	29.651	5.978
3	73.000	43.836	2	29.187	5.885

Source: Own calculations. Data collected in 2006

Note: Betweenness is a measure of the number of times a vertex occurs on a geodesic. The normalized betweenness (nBetweenness) centrality is the betweenness divided by the maximum possible betweenness expressed as a percentage (FREEMAN,1979).

In lending relationships (see Table 23 and Table 24), actor 1 is the most central one in respect to both in-degree and out-degree centrality scores. Actor 16 has seven in-degree but only two out-degree ties. This means that she receives money from seven other network members and lends money to two other network members. The actors 1 and 2 occupy the most central positions in respect to their closeness and betweenness centrality scores.

It seems that provided help in one type of network relationship (information exchange, labour exchange) in a way secures help and support in another type of relationship (lending and borrowing). In lending relations those with better income situation occupy the most central positions in the network. Both the actor 1 and the actor 2 are involved in on and off farm activities and have better income and wealth situation compared to other network members. Thus, for joint liability lending groups the income heterogeneity of group members may support the success and the repayment of the group as the ability and the willingness to lend money to a group member to prevent him from defaulting will benefit the groups as a whole.

Table 25 and Table 26 present the demographic characteristics, so called the attributes, of network members. As it can be seen the central men network members (actors 1, 2, and 4) are relatively younger age than the network average. The central woman network member (actor 16) however is older than the network average. All of them have higher educational level than the average of the network. In respect to total lend holding the actors 1, 4 and 16 are better of than the average number. Actor 2 though possess only 1.7 ha of land is involved in an off-farm activity and runs his own furniture production business. From 18 network members involved in off-farm activities, 9 are credit group members.

Table 23: **Lending degree centrality values of the top ten members of the network**

Actor	Out degree	In degree	Total interactions
1	9	8	17
15	6	5	11
13	6	4	10
2	5	4	9
14	5	4	9
3	4	6	10
11	4	2	6
4	2	2	4
16	2	7	9
6	2	2	4

Source: Own calculations. Data collected in 2006.

Table 24: Closeness and betweenness centrality measures for lending exchange relations

Actors	Farness	nCloseness	Actor	Betweeness	nBetweeness
1	443.000	7.390	1	85.000	17.137
2	440.000	7.273	2	83.500	16.835
15	440.000	7.273	6	64.000	12.903
13	440.000	7.273	18	53.000	10.685
6	443.000	7.223	16	37.000	7.460
16	444.000	7.207	25	19.000	3.831
3	445.000	7.191	17	19.000	3.831
14	445.000	7.191	8	19.000	3.831
4	446.000	7.175	15	18.500	3.730
11	449.000	7.127	13	18.000	3.629

Source: Own calculations. Data collected in 2006.

Note: Betweenness is a measure of the number of times a vertex occurs on a geodesic. The normalized betweenness (nBetweenness) centrality is the betweenness divided by the maximum possible betweenness expressed as a percentage (FREEMAN, 1979).

Table 25: Demographic characteristics of the top four network members in relation to that of the network

	Min	Max	Average	A1	A2	A4	A16
Age	26	54	43	37	37	38	49
Education	8	17	12	16	16	16	15
Total land holding	1.1	4.6	2	4	1.7	4.5	3

Source: Own calculations. Data collected in 2006.

Note: Average values refer to the median.

Table 26: Demographic characteristics of the network members

	Frequency	Percentage
Gender		
men	31	93.9
women	2	6.1
Off farm employment		
no	15	45.5
yes	18	54.5

Source: Own calculations. Data collected in 2006.

The meso level analysis of the network, that is the distribution of actors' degree centrality scores in respect to information exchange, labour exchange and lending relations, is presented in Table 27. The data is symmetrised, that is the direction of ties are ignores, for these analyses.

On average, actors have a degree of 5.818 information exchange, degree of 5.030 labour exchange and degree of 2.364 lending ties. The numbers are relatively low

considering that there are 32 other network members. Variances are relatively high compared to the mean value. To identify the range of variability that gives information about whether the population is homogeneous or heterogeneous in structural position the coefficients of variation are calculated following HANNEMAN and RIDDLE (2005) definition.

Equation 3:

Coefficient of variation = (standard deviation/mean)*100

Table 27:   Summary statistics for degree centrality measures of information exchange, labour exchange and lending relations

	Degree Information	Degree Labour	Degree Lending
Mean	5.818	5.030	2.364
Std Dev	3.079	2.918	2.508
Sum	192.000	166.000	78.000
Variance	9.482	8.514	6.292
Min	2.000	1.000	0.000
Max	15.000	13.000	9.000

Source: Own calculations. Data collected in 2006.

The calculated coefficient of variation is 53 for information exchange, 58 for labour exchange and 106 for lending relations. The figures show that the population is relative heterogeneous in its structural position in respect to information exchange and labour exchange relationships and highly heterogonous in respect to lending relations. Thus the bonding social capital Horizontal social relations) is unevenly distributed in the network and there is much of deferens in the amount of help and support different network members may have.

The last part of the information, Table 28, are the results of macro level analysis that describes the studied population as a whole based on the network degree centralisation of the graph.

Table 28:   Network degree centralisation (%)

	Out degree	In degree
Information Exchange	30	24
Labor Exchange	16	28
Lending	23	20

Source: Own calculations. Data collected in 2006.

It shows the degree of inequality as a percentage of that in a star network of the same size[24] (see Section 4.2).

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[24] The degree of inequality in a star network is equal to 100 % which is the theoretical maximum.

As the results show, there exists a noticeable amount of centralisation in the whole network, which means that there is a substantial amount of power of a few individual actors and overall positional advantages are rather unequally distributed.

To make the findings more obvious, the data matrixes are combined, and the tie strength degree centrality scores are calculated. As Table 29 shows the actor 16 with forty two, actor 1 with thirty six, the actor 2 with 32 tie connections occupy the most central positions. On average the actors have 17 ties and the variance in the network is high (see Table 30).

Table 29: Tie strength – Degree centrality values of the top ten members of the network

Actors	Degree
16	42
1	36
2	32
13	31
14	29
3	28
15	28
11	27
6	25
4	22

Source: Own calculations. Data collected in 2006.

Table 30: Summary statistics for degree centrality measures of tie strength

	Degree
Mean	17.152
Std Dev	9.567
Sum	566.000
Variance	91.522
Min	5.000
Max	42.000

Source: Own calculations. Data collected in 2006.

The coefficient of variation is 56 showing that the studied population is moderately heterogeneous in its structural position in respect the tie strength – bonding social capital. Thus, those with higher bonding social capital are in advantageous position in the network in that in case of need they have better chances to receive higher amount of help and support The calculated network centralisation score is 21 % which shows that the amount of power is centralised around the limited number of network members.

6.3 Results of the empirical model

Guided by the theoretical framework and empirical literature, seven sets of variables are included in the model, which are expected to influence credit repayment performance of individual members. SIMTOWE and ZELLER (2006) used similar indicators to study the evidence of moral hazard in Malawi.

The logit model tests the role of social capital for loan repayment behaviour of joint liability credit group members.

The model is as follows:

Equation 4:

$$R\_B = f(C\_A, C\_SC, S\_SC, FP, D\_I, I\_M, C\_V)$$

where repayment behaviour *(R_B)* of joint liability group members is measured as binary variable (yes = credit is repaid on time, no = credit is not repaid on time). Following the formulations of VAN BASTELAER and LEATHERS (2006), three set of proxy indicators of social capital are included in the model. The parameter *C_A* stands for the factors affecting collective action, C_SC stands for cognitive social capital, S_SC stands for structural social capital.

FP stands for farm productivity, D_I stands for dynamic incentive, I_M stands for incentive matching and C_V stands for selected control variables. See Table 31 for the summary statistics.

6.3.1 Descriptive statistics of the variables in the empirical model

The ***dependent variable*** is dichotomous, that is the repayment behaviour *(R-B)*. The variable takes the value of one if the full amount of credit is repaid and zero otherwise. The repayment is accepted only if the full amount of the group loan that is the full amount of each group member credit is collected and repaid at the same time. This means that though the group internally may collect partial payments from its members, the whole sum should be collected before the credit of the group can be repaid. Only after, the group can apply for the new loan cycle. The data was collected by asking each of the interviewed members if he/she did pay the whole amount of his/her credit back. From the 86 members in the sample, 40 reported an incidence of non repayment (see Figure 12).

Figure 12: Frequency of the repayment incidence, by group member
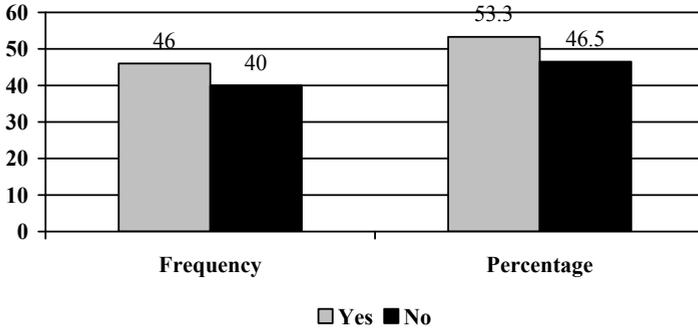
Source: Own calculations. Data collected in 2006.

Factors affecting collective action in the group. Three variables are introduced in the model to capture the impact of collective action on the repayment behaviour. The members that perceive others in the group as more homogenous *(P_GH)* in terms of risks – effective peer selection (GHATAK, 1999) and homogeneous in terms of economic power – increased peer monitoring (STIGLITZ, 1990) expect better group dynamics and thus are expected to show better repayment behaviour. DEVEREUX and FISHER (1993: P. 106) argue "… if the groups are organised with non homogeneous members which might occur if some members misinterpret their economic status, then the potential for default is high and the chance that the group will remain together over time is low". The expected sign of the variable is positive. 20 respondents perceive co-borrowers as heterogeneous, 20 slightly different from each other and 40 homogeneous (see Figure 13).

The results of empirical studies on the role of group homogeneity in explaining group repayment are diverse. MOSLEY (1996) did not find a significant difference between homogeneous and non homogeneous group performance in Bolivia. However, the possibilities to get peer support were higher in non homogeneous groups. SADOULET (1997) in his study in Guatemala finds similar results and suggests that heterogeneity provides a place for insurance arrangements. Supportive results are found by ZELLER (1998) in Madagascar. He suggests that the hetero-geneity in asset holding and off and on farm activities provide better risk pooling possibilities to group members. SHARMA and ZELLER (1997) found negative impact of group homogeneity in terms of asset and enterprise diversity in the credit groups in Bangladesh.

Figure 13: Frequency of the perception of income homogeneity, by group members
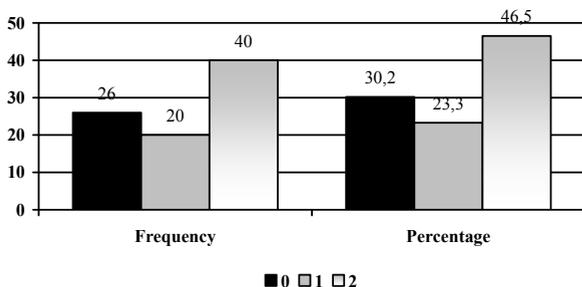
Source: Own calculations. Data collected in 2006.

Note: 0 = heterogeneous, 1 = slightly different, 2 = homogeneous.

The members connected with a higher number of family relations *(F_R)* (see Figure 14) have strong social ties beyond credit group activities and have better access to relevant information to screen, monitor and enforce the individual loan repayments. High levels of social ties facilitate peer monitoring and loan enforcement by the increased potential of social pressure and sanctions (BESLEY and COATE, 1995). As suggested by STIGLITZ (1990) and GHATAK and GUINNANE (1999) mutual monitoring and enforcement of borrowers reduce the cost of monitoring by lending intermediaries and increase the repayment performance of group members. The same time DIAGNE (1998), as cited by SIMOWE and ZELLER (2006), states that for effective monitoring it is important that the group members have access to the relevant information but it is as well important that they be willing to be engaged in monitoring and enforcement activities.

HUPPI and FEDER (1990) state that if under joint liability condition an individual repays while the most of the group members do not, he or she would be made worse off by having paid their share and also being responsible for the loans of defaulters.

The enforcement assumption of peer pressure by the use of social sanctions however does not work efficiently in the studied region of Armenia. No case of social sanction was recorded during the interviews. It has been stated by several group members that thought they have enough information to predict the ability and the willingness of co – borrowers to repay but they would most probably not be willing to sanction those who default. The cultural factors to keep long lasting relationship with the neighbours and relatives, possibly as social safety nets, seem to be more important than the short time benefits accruing from borrowing. The danger exists that the members with higher number of family connections may choose rather to support the defaulters, by collective defaulting action, than to choose to enforce the repayment. Thus, the expected sign of the variable is undetermined. 15 of interviewed members are connected to co borrowers with 1 family ties,

18 members with 2 ties, 3 members with 3 ties and 6 members with 7 family ties, 43 respondents stated not to have any family relationship with the co borrowers (see Figure 14).

Figure 14: Frequency of the number of family ties per credit group member
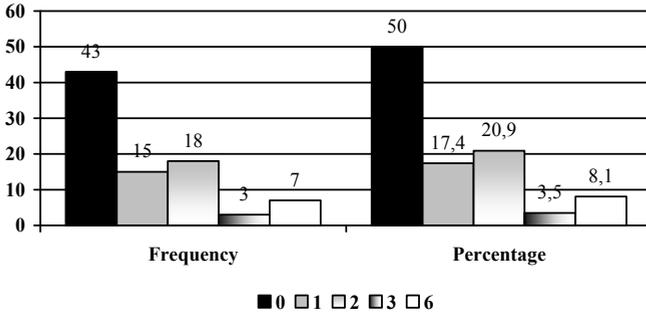
Source: Own calculations. Data collected in 2006.

Note: 0, 1, 2, 3, 6 show the number of family ties; Number of group members = 86.

The higher number of years of membership *(Y_M)* is expected to result to higher repayment rates. The expectation is that over the years, members develop loyalty and strong social ties to the program and to the group members thus show better repayment behaviour.

The expected sign of the variable is positive. 5 respondents are with the groups for 1 year, 28 for 2 years, 38 for 3 years, 9 for 4 years and 6 for 5 years of membership (see Figure 15).

Figure 15: Frequency of the years of membership of credit group members
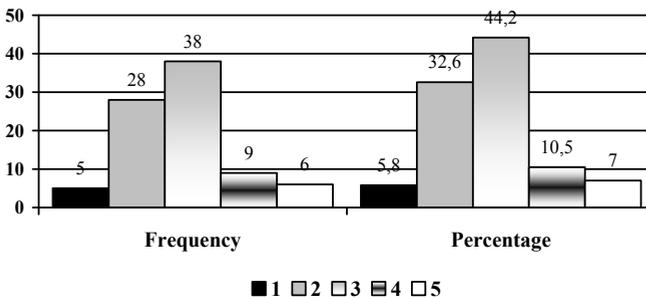
Source: Own calculations. Data collected in 2006.

Note: 1, 2, 3, 4, 5 show the years of membership; Number of credit group members = 86.

Proxies for structural social capital. As discussed earlier (see Chapter 2.6) the main innovation of group joint liability approach is that lending institutions rely upon borrowers' comparative information advantage to solve the problems of screening, monitoring and enforcement. The higher the number of existing associations is, clubs and groups in the community the more are the channels through which information as well as the gossip in the community flows (VAN BASTELAER, 2000). This means more transparent information availability and better possibilities for group members to access the creditworthiness and the intended purpose of co borrowers. Thus the better screening, monitoring, enforcement accordingly better repayment performance is expected. The structural social capital in the community *C-SSC* is proxised by the number of existing associations, clubs, and political parties in the villages. The expected sign of the variable is positive. 56 respondents stated there are overall 3 associations in the villages and 30 of them stated that there are 4 associations (see Figure 16).

Figure 16: Structural social capital in the villages
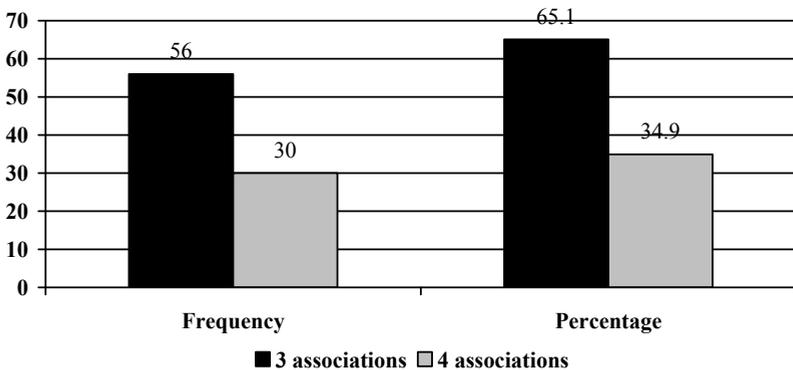
Source: Own calculations. Data collected in 2006.
Note: 3, 4 show the number of associations, political parties and clubs in the village.

The danger to loose reputation by being excluded from one or the other association, club or the group may be a strong incentive for borrowers to repay the credit. This is because bad reputation and exclusion from one of the groups may deny access to further possible economic and social benefits that other groups provide. Thus the higher the number of associations the more transparent is the information about oneself. Accordingly better repayment performance is expected. The level of structural social capital of credit group members *M-SSC* is measured by the membership to the number of existing associations and clubs. The expected sign of the variable is positive. 41 respondents recorded to belong to 1 of the associations in the village and 7 of them to 2 associations, 38 do not have membership to any of associations (see Figure 17).

Figure 17:   Structural social capital of the group members
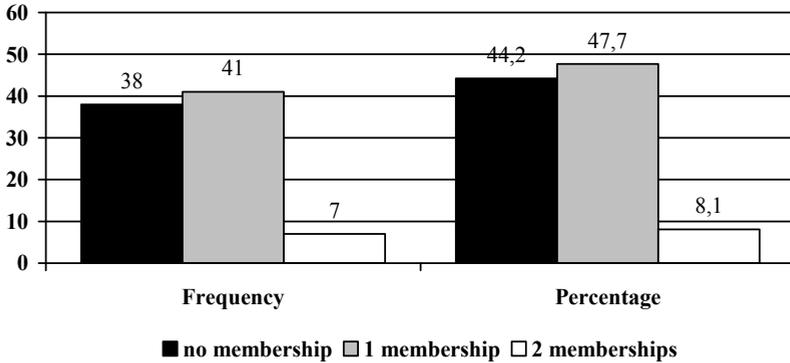
Source: Own calculations. Data collected in 2006.

Note: 0, 1, 2 show the number of memberships in associations.

Proxies of cognitive social capital. The level of mutual trust in the community affects social perception about ones expected behaviour. Non trustworthy behaviour by credit default action may result to the lost of reputation and possibly to social exclusion. Thus it acts as powerful incentive for good repayment performance. The sign of the *(G_T)* variable that is trust towards any other member in the community is positive. 56 of the interviewed members stated that most of the people in the community can not be trusted, 27 of the stated that some of the people in the community can be trusted and some of the people not, 3 of them stated that most of the people in the community can be trusted (see Figure 18). It seems that the level of generalised trust is not so high in rural Armenia, so people are careful to whom to trust.

Personal trust between credit group members *(T_GM)* variable captures the impact of the group trust on the repayment. The expected sign of the variables is positive. 28 respondents stated that most of the members in the credit group can not be trusted and 58 recorded that they trust their group members (see Figure 19). CASSAR et al. (2007) caring out microfinance experiments on different indicators that present the main characteristics of actual microloan recipients in Nyanga, South Africa and Armenia found that personal trust between individuals in the groups has a positive impact on group performance. General trust on the other hand did not show significant impact on group performance.

Figure 18: The level of generalised trust perceived by members of credit groups
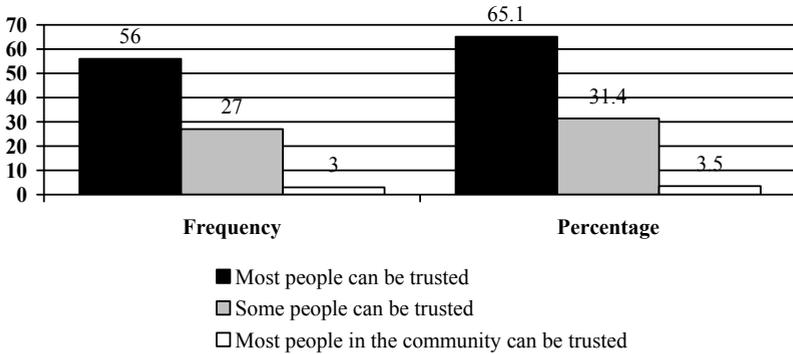
Source: Own calculations. Data collected in 2006.

Figure 19: The level of trust towards the group members, by members of credit groups
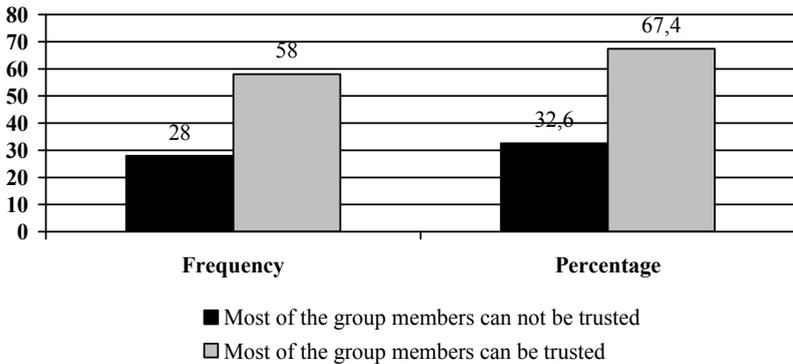
Source: Own calculations. Data collected in 2006.

Empirical evidence concerning the determinants of repayment rates in group lending in respect to social capital indicators are controversial. WYDICK (1999) in his study in Guatemala recorded that social cohesion and the strong social ties have rather negative than positive impact on repayment rates. In the case of Bangladesh, SHARMA and ZELLER (1997) found a negative relationship between the presence of relatives in the group and the repayment rates. They also stated that the groups which followed the self-selection criterium perform better. Similarly, VAN BASTELAER and LEATHERS (2006) identified a negative relationship between the participation in the same church and the repayment rates of joint liability

seed groups in Zambia. WENNER (1995) on the other hand in his study in Costa Rica pointed out that the written internal rules about ones expected behavior in the group facilitate credit repayment. The results were supported by ZELLER'S (1998) findings in Madagascar where the groups with stronger social ties and with internal rules performed better.

Productivity. Several authors, MATIN (1997), AHLIN and TOWNSEND (2003), and SIMTOWE and ZELLER (2006) included production factors such as land and education in the repayment behaviour models to capture the impact of productivity on the repayment. They show how higher productivity reduces moral hazard in credit groups. The partial farm productivity *(P_FP)* in relation to land size variable is included in the model to capture the impact of productivity on members' repayment behaviour. The expectation is that higher productivity promoted better repayment behaviour of the members. This is because the output and the profit group members make are expectedly high enough to repay the credit. The expected sign of the variables is positive.

Dynamic incentive for further access to credit. The impact of the dynamic incentive *(D_I)* is captured by asking each group member if he/she is willing to contribute an equal amount of money shared with other group members to repay the credit of defaulters. DIAGNE (1998), PAXTON (1996), SIMTOWE and ZELLER (2006) pointed on the importance of dynamic incentive for credit repayment. The question of the willingness to contribute to the sum of money to repay the credit of defaulters did not include the option or the condition of excluding the defaulters for the next loan circle from the group.

From the lender point of view, the best way to enforce the repayment is to punish the whole group by denying access to the next loan cycle if some of group members default, so called "contingent renewal principle" (VAN BASTELAER, 2000). For this reason the incentive of the further access to credit should be high enough to make the group members to repay for the defaulters.

30 respondents stated they will not contribute to the sum of money to repay the credit of defaulters as they expect the same behaviour to be repeated in the next round. 56 of the respondents stated they are willing to contribute to the sum to solve the problem and to move the group forward (see Figure 20).

Figure 20:   The level of dynamic incentive in the group
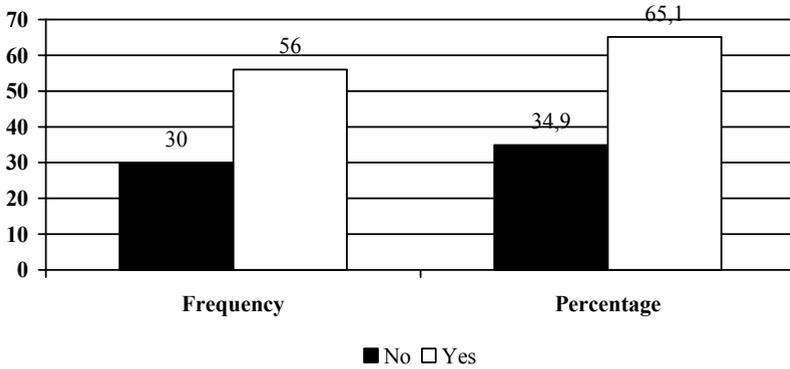
Source: Own calculations. Data collected in 2006.

Note: Number of respondents (group members) = 86.

Incentive matching. The variable loan cycle *(L_C)* captures the impact of different incentives different group members may have. This is because different members develop their businesses with different speed or because new members join the groups where other co borrowers already have developed entrepreneur skills (SIMTOWE et al., 2006). Thus, differences in a type and amount of demanded credit may arise. For some of the members, the supply of the credit may not anymore match the demand they have (PAXTON, 1996). Group performance may change during the time. The mismatching may result to increased number of defaulting credits. The expected sign of the variable is negative. The groups of 17 interviewed members have been in the second loan round, of 44 members in the third round, of 14 members in the fifth round and of 11 members in the sixth round (see Figure 21).

Figure 21: The loan cycle of the groups
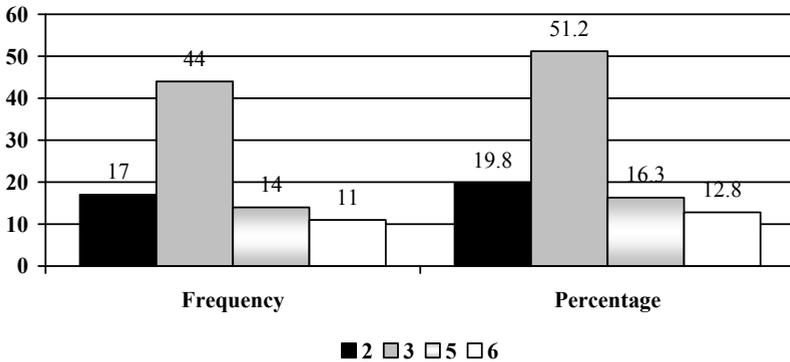
Source: Own calculations. Data collected in 2006.
Note: 2,3,5,6 refer to the respective loan circles of the group since group foundation. One recall period is equal to one year.

Control variables. In addition, three control variables the age *(M_A)*, the education *(M_E)* of credit group members and the size of the group *(G_S)* are included in the model. The impact of group size on group performance is widely discussed in literature. DEVEREUX and FISHE (1993) found mixed success of credit groups which exceed ten to twelve members. Referring to OWUSU and TETTEH (1982) they argue that in Ghana an important feature of successful group lending is the relatively small membership number in each group. MOSLEY and DAHAL (1985) found low level of trust in Grameen model groups more than of 20 persons in Nepal. The expected sign for first two variables is positive. The expected sign of *(G_S)* variable is negative.

Table 31:   Summary statistics of regression variables

Variable	Description	Min	Max	Mean	S.D	Exp Sign
Dependent variable						
Repayment behaviour (R_B)	Did you pay the full amount of borrowed credit in the last loan circle back? (1=yes, 0= otherwise)	0	1	0.53	0.502	
Collective action						
Years of membership (Y_M) (years)	For how many years are you a member of the present credit group?	1.0	5.0	2.80	0.956	+
Perception of group homogeneity (0=heterogeneous, 1 = slightly different, 2 = homogenous)	To your opinion how homogeneous are the group members in terms of their wealth status?	1.0	3	2.16	0.866	+
Family relations (F_R) (number)	To how many members in the group do you have close and/or extended family relations?	0	6	1.19	1.69	+ (-)
Cognitive social capital						
Generalised trust (G_T) (0 = most cannot be trusted, 1 = some can be trusted some not, 2 = most can be trusted)	Do you think most of the people can be trusted?	1	3	1.38	0.557	+
Trust in the group (T_GM) (1 = most members can be trusted, 0 = most members can not be trusted)	Do you think most of the members in the credit group can be trusted?	0	1	0.67	0.471	+
Structural social capital						
Structural social capital in the community (C_SSC) (number)	What is the total number of existing associations, political parties, cultural and sport clubs in the village?	3	4	3.35	0.479	+

Table 31:	Summery statistics of regression variables (continued)					
Variable	**Description**	**Min**	**Max**	**Mean**	**S.D**	**Exp Sign**
Structural social capital of group members (M_SSC) (number)	To how many associations, political parties, sport and cultural clubs you have membership?	0	2	0.64	0.631	+
Productivity						
Partial farm productivity in relation to land/1000 (P_FP) (US dollars)		0.14	20.3	1.39	2.25	+
Dynamic incentives						
Dynamic incentive (D_I) (1 = yes, 0 = no)	Will you contribute an equal amount of money shared with the other group members to repay the credit of defaulters?	0	1	0.65	0.479	+
Incentive matching						
Loan circle (L_C) (number)	What is the groups' currents loan circle?	2	6	3.51	1.326	_
Control variables						
Members age (M_A) (years)	How old are you?	26	63	42.99	7.376	+
Members education (M_E) (years)	What is the total year of your formal education?	8	17	12.14	2.087	+
Group size (G_S) (number)	What is the number of your group members at present?	14	27	19.13	4.138	–

Source: Own calculations. Data collected in 2006.

6.3.2 Results of the credit repayment model

The result of the regression analysis is presented in Table 32 and Table 33 presents the results of the regression analysis when the backward selection procedure in the binary logit model is applied. Table 34 and Table 35 present the classification tables.

Four variables in the model turned out to be the significant determinants for good repayment performance of credit group members.

Table 32:   Results of regression analysis for the repayment model estimated by logit estimation

Variable	Coefficient	S.E.	Wald	Sig.
Factors affecting collective action				
Y_M	0.459	0.439	1.094	0.295
P_GH	-0.242	0.474	0.259	0.610
F_R	0.133	0.372	0.128	0.719
Cognitive social capital				
G_T	1.085	0.719	2.278	0.131
T_GM	2.907	1.116	6.333	0.012**
Structural social capital				
C_SSC	0.207	0.913	0.052	0.820
M_SSC	2.199	0.749	8.610	0.003***
Productivity				
P_FP	0.2066	0.390	0.280	0.596
Dynamic incentives				
D_I	0.675	0.783	0.743	0.388
Incentive matching				
L_C	-0.369	0.395	0.872	0.350
Control variables				
M_A	0.131	0.062	4.489	0.034**
M_E	0.167	0.201	0.694	0.404
G_S	0.096	0.143	0.457	0.498
Constant	-15.160	5.732	6.994	0.008

Source: Own calculations. Data collected in 2006.

Note: Nagelkerke R^2 = 0. 673, *Significance at the 10 % level, **Significance at the 5 %level, ***Significance at the 1 % level. Overall percent correct 84.88 % (see Table 34).

Cognitive social capital. The cognitive social capital in the community estimated with the level of generalised trust variable *G_T* is positive but is significant only on 13 % level. The existence of higher level of trust in the village thus supports the good repayment performance of group members. However, it is only moderately significant.

The level of trust of group members towards each other *T_GM* variable is positive and is significant on 5 % level. This may indicate that the repayment of individual members highly depends on their subjective believe that other group members will repay their loans too. This is important as the repayment of others may determine if the loan will be available in the next round or not. As BASLEY and COATE (1995) noted, if the same good individuals observe, in this case expect, others defaulting, they may default too, since they will not receive a new loan even if they repay and they do not need to repay the loans of others.

Structural social capital. The structural social capital in the community (*C_SSC* variable) is positive but is not significant. The number of existing associations seems though to promote information flow does no influence on credit repayment. The group members' structural social capital variable (*M_SSC*) is positive and is significant at the 1 % level. Thus, the membership in associations indeed facilitates ones adherence to norms and results to better credit repayment. However, it may merely be done to secure good social reputation to ensure future economic benefits.

Control variables. The age of credit group members *M_A* variable is positive and is significant on 5 % level. This may probably be explained by the cultural and historical reasons. Firstly, Armenia is still a quite traditional society with older members having the most respectful but as well more responsible positions in families and in communities, thus feel obliged to keep this reputation. Second, the soviet era mentality of the obligation to fulfil the responsibilities towards formal institutions seems to be stronger in the character and in the minds of older than younger generations.

Table 33: Results of regression analysis for the repayment model estimated by logit estimation by implementing backward selection procedure

Variable	Coefficient	S.E.	Wald	Sig.
Cognitive social capital				
G_T	1.158	0.590	3.853	0.049[**]
T_GM	2.583	0.770	11.233	0.008[**]
Structural social capital				
M_SSC	2.014	0.576	12.229	0.001[***]
Control variables				
M_A	0.091	0.048	3.503	0.061[*]
Constant	-8.403	2.683	9.806	0.002[***]

Source: Own calculations. Data collected in 2006.

Note: Nagelkerke $R^2 = 0.625$, [*] Significance at the 10 % level, [**] Significance at the 5 %level, [***] Significance at the 1 % level. Overall percent correct 81.40 % (see Table 35).

Table 34: Classification table

		Predicted		Percent Correct
		0	1	
	,00	33	7	82,50 %
Observed	1,00	6	40	86,96 %
				Overall 84,88 %

Source: Own calculations. Data collected in 2006.

Table 35:   Classification table when backward selection procedure is applied

		Predicted		Percent Correct
		0	1	
	,00	31	9	77,50 %
Observed	1,00	7	39	84,80 %
				Overall 81,40 %

Source: Own calculations. Data collected in 2006.

7 CONCLUSIONS AND RECOMMENDATIONS

The theoretical literature on social capital suggests that the use of existing social networks supports ones access to productive resources. The theoretical models of joint liability credit groups argue that through the use of social capital of borrowers, the repayment performance of groups is improved.

This work reviewed both, theoretical and empirical literature on social capital and its effect on borrowing contracts. By implementing quantitative social network analysis, the significance of social networks as providers of new economic opportunities and as social safety-nets in the studied region of Armenia is tested. Bonding and bridging dimensions of social capital are used for these analyses.

By estimating a binary logit model, the importance of different traits of social capital (expressed in indicators) on the loan repayment performance of individual credit group members on the basis of their social capital structure is studied. Structural and cognitive dimensions of social capital are used for these analyses.

7.1 Conclusions and recommendations – Social network analysis

The results of social network analysis suggest that with the economic transition of Armenia, the pattern of social support networks has changed and narrowed down to family cycles. The empirical evidence suggests that people rely more on the support of relatives than on other, non-related network members. These private safety-nets seem to be an important livelihood coping strategy as people involved in agriculture bear a great risk of economic shocks and have limited or no access to assistance from the State.

This study looked at network structures and analysed the roles and positions of individual members in the studied social network. The studied population is found to be relative heterogeneous in its structural position. Specifically, bonding social capital is unevenly distributed in the network and there is much of deviance in the amount of help and support that different network members may enjoy. In addition, a substantial amount of power is concentrated around a few individual actors and overall positional advantages are rather unequally distributed.

The analysis of bridging social capital, measured by the membership to existing associations in the village showed that an equal access to the bridging social capital at the village level does not guarantee equal access to information and equal access to new economic opportunities to all. First, the purpose of the association seems to determine the type of information its members have access to, with political oriented associations providing less information related to economic

resources. Different roles and positions of individual members in associations, previous experience and personal contacts with staff members of project implementing organisation seem to be important factors too for individual access to valuable information.

Thus, the findings support the hypotheses that

- the individuals in key structural positions in communities and in networks have better access to productive resources and new economic opportunities and that

- the individuals with a higher stock of bonding and bridging social capital have better access to the help and support but also better access to various information sources and new economic opportunities.

Some of the additional findings of the network analysis, which may have policy relevant implications are presented below:

- Women seem to play an important role for emotional contacts, for uniting network and group members and for information transfer activities such that they promote the provision of more of instrumental help and support.

- The central male network members are relatively younger than the network average. The central female network members, however, are older than the network average.

- In lending relations, those with a better income situation occupy the most central positions in the studied network.

Results imply that women may play an important role for the success of development interventions and could more intensively be integrated in development activities especially for community based empowerment and bottom up development projects. Joint liability based microcredit providers ought to pay more attention to attracting and including women in credit groups reaching to the optimal gender mixture. Especially those women with relatively higher age may positively contribute to the functioning of such groups. In addition, the income heterogeneity of group members may support the success and improve the repayment performance of such group.

Further research is needed to study the pre-existing social capital between the individual members of associations and project staff. In addition, further research may look at the aims of associations and their main function as well as at the composition of the membership with respect to both, demographic and relational indicators in order to get insights into who and how they benefit the most.

7.2 Conclusions and recommendations – Logit model

The results of the logit model revealed that higher level of cognitive social (generalised trust) capital in the community contributes positively to good credit repayment. However the significance is not high. The higher level of structural social capital in the community (existing associations), which is influencing positively credit repayment, did not show a significant impact. The higher level of cognitive (personal trust towards each other in the group) and structural (membership to associations) social capital in credit groups are highly significant factors promoting the good performance of individual members under such borrowing conditions. Credit group level social capital turned out to be more important than village level social capital for the good functioning of such groups.

Thus, the results support the hypothesis that

- the higher the level of social capital of group members, the better is the repayment behavior of individual members under joint liability borrowing.

- Another significant factor for good repayment performance is found to be the age of the borrower, with older members performing better.

The findings are on the line with theoretical and those empirical literature which record positive impact of social capital indicators on the performance of joint liability borrowing groups.

Further research may be useful to study how far this is a common trend in Armenia or whether it was conditioned to the limited scope of this study. Moreover, further research may look on the evidence of moral hazard and on full defaulting groups to identify which other factors play a role. In addition, the role of established social capital between credit group members and project staff for credit group performance, which was out of the scope of this study, needs attention.

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Appendix 1: Administrative map of Armenia
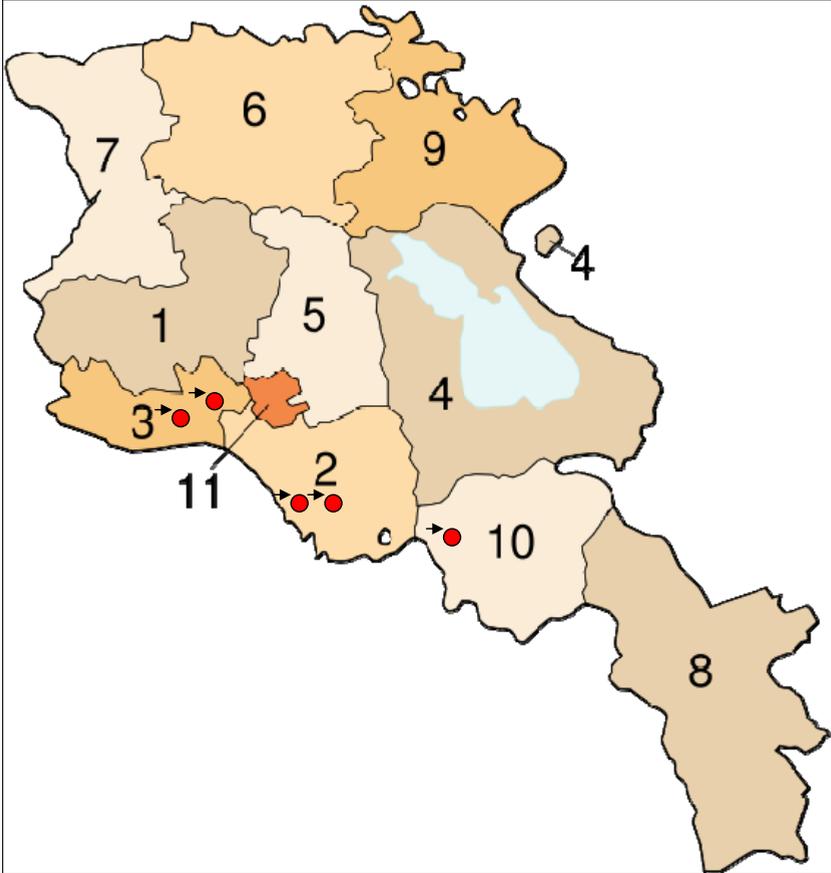
Source: http://en.wikipedia.org/wiki/File:Armenia_map_numbered.svg.

Note: The study regions included Ararat, Armavir and Vayots Dzor marzes. The locations of credit groups, on the map, are marked with circles.
1 = Aragatsotn marz, 2 = Ararat Marz, 3 = Armavir marz, 4 = Gegharkunik marz, 5 = Kotayk marz, 6 = Lori marz, 7 = Shirak marz, 8 = Syunik marz, 9 = Tavush marz, 10 = Vayots Dzor marz, 11 = Yerevan – the capital of the country – special status of a marz.

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