Social Capital and Group Lending:
Evidence from Joint Liability Seed Loans in Zambia’s Southern Province

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January 30, 2002; revised June 2004

DRAFT – FOR DISCUSSION ONLY

Abstract

The purpose of this paper is to identify the factors that are associated with high repayment performance by seed borrowers in Southern Zambia, in particular those associated with the growing literature on social capital. The existence and continuing operation of farmer seed groups indicate that they can succeed where the private market fails. This success is a result of lower transactions costs, compared to private firms. But all farmer groups are not equal. Some are relatively successful at enforcing repayment; and others are less successful.

The results presented here suggest that some factors facilitating collective action within seed groups, such as its size, are associated with higher repayment performance. The age of the group and the distance between members’ houses and plots, which would be expected to reflect the ease of the group member to harness collective action and mutual monitoring, do not appear to affect repayment, probably due to membership fluidity and fear of witchcraft, respectively. The frequency of group meetings negatively affects repayment rates. This suggests that, rather than being a determinant of group performance, the number of meetings may actually be an indicator of it.

Measures of structural social capital such as participation in associations and networks fail to explain group repayment behavior, with the exception of membership in the same church, which is negatively related with repayment rates. This result suggests that the strength of bonds linking co-parishioners override the peer pressure expected from members of the same seed group. Cognitive social capital, proxied by here by trust toward strangers, is strongly associated with repayment performance. This suggests that attitudes and values shared by community members create an environment in which actors—in this case seed borrowers—put value in honoring their engagements.

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I. Introduction

When the concepts of social capital and group-based microfinance appeared—almost simultaneously—on the development scene, social scientists and practitioners quickly recognized the relevance of social capital to the study and development of group lending programs. It was hypothesized that the presence of social capital in a community would facilitate the selection of creditworthy co-borrowers, the mutual monitoring of their loan use, and peer pressure for repayment. To date, however, few studies have attempted to empirically test the role of social capital in explaining the performance of group loan programs.

This paper aims to contribute to this growing empirical literature by examining the factors that help explain the difference in repayment performance of seed loans among joint-liability groups in Southern Zambia. In that region, donor groups have led substantial efforts to encourage the formation of smallholder groups to facilitate the distribution of seed. There is a strong basis—in economic theory, in common sense, and in practical experience—for believing that these groups can improve the productivity and prosperity of the farmer-members by improving farmers’ access to purchased inputs (Kähkönen and Leathers 1997).

An important aspect of these farmer-groups has gone largely unexamined. As with many institutional arrangements, the success of seed groups depends on the extent to which transactions costs can be reduced. The main focus of this paper is to analyze factors that result in lower transaction costs and therefore in more successful group operations. Are small groups more effective than large groups? Are groups that meet frequently more effective than groups that meet infrequently? Does social capital within farmer groups or the surrounding communities affect repayment behavior?

To help provide preliminary answers to these and other questions, this paper analyzes data from 256 smallholder groups in southern Zambia, all of which are involved in distribution of seed. We identify some of the factors that contribute to seed loan repayment behavior and suggest in particular that norms of mutual trust play an important role in determining repayment rates. We also find that fear of witchcraft and strong fellowship among churchgoers can hinder mutual monitoring and loan repayment enforcement.

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Seed: A Critical Input for Improvement of Smallholder Agriculture

Providing access to seed for small farmers potentially raises productivity by improving seed quality, by making genetically improved crop varieties available to farmers, and by introducing new crop alternatives.

Seed quality can vary substantially depending on its source. At one extreme, seed produced by agricultural research laboratories under carefully controlled conditions can be relied on to exhibit the characteristics intended by the developer. At the other extreme, seed planted from grain saved from the previous year's crop represents the lowest quality seed. Between these extremes can be found seeds of various quality, depending on how carefully crop production has been supervised, and how the produced seeds have been sorted, chemically treated, stored, and marketed.\footnote{See Zulu (2000).}

The introduction of new varieties of traditional crops requires seed from outside. Agricultural research devoted to developing new varieties of traditional crops (notably maize) can select varieties for characteristics such as resistance to drought, disease, or pest. As new varieties are developed, their impact depends on getting seed into the hands of farmers. The continued use of the improved varieties therefore depends on the existence of a system of seed distribution that puts clean, treated, and sorted seed of the new variety in the hands of farmers year after year.

The existence of a means of distributing seed to smallholders in Zambia also creates the possibility of introducing new crops in the countryside. One of the earliest successes of the CARE seed distribution effort was the introduction of green gram and other pulses which are more drought-resistant than maize. The introduction of new crops has the primary effect of improving food security by diversifying a farmer's "crop portfolio," but also has the effect of improving nutrition through adding diversity to farm household diets.

Transactions Costs and Institutional Impediments to Market-Based Seed Distribution

In light of the importance of seed in improving agricultural productivity, it seems logical to investigate why private markets have not emerged to make seed available in the Zambian countryside. Of course, markets do exist and serve the large commercial farm sector in Zambia (Zulu 2000, Musona 2000). But their failure to reach smallholders in Zambia is a result of high transactions costs, of which there are three main sources: (1) small transaction size; (2) remoteness of farm locations; and (3) limited use of credit to facilitate seed purchases.

It is difficult to exaggerate the small size and the remoteness of the majority of farms in Zambia. To illustrate, the 1882 farmers belonging to the groups surveyed (and for which data were available) plant an average of 1.24 limas (0.31 hectares) per farmer. The groups are, on average, located 45 kilometers from the nearest line-of-rail town.
Their remoteness is intensified by the fact that roads to the respondents’ villages are non-existent or extremely poor, and by the fact that the only form of transportation available to most smallholders is travel by foot.4

The small size and remoteness of farms make it infeasible for a seed dealer to set up a store in a town or other central location and expect a sufficient volume of business to cover the fixed costs of his/her operation. Only a few smallholder farmers would reach the store’s location and each of the customers would buy small quantities of seed. Any attempt to cover costs by increasing prices would further reduce the number of customers. For similar reasons, it is infeasible for a seed dealer to sell seed by visiting farmers. Although the seed dealer may have an advantage over many farmers in transportation options, s/he faces the additional disadvantage of not knowing the locations of potential customers.

In addition to remoteness of farms, the extreme poverty of the smallholders makes it difficult or impossible for most of them to assemble sufficient cash assets to purchase seed at planting time. One solution to this problem is to sell seed on credit, expecting payment after the crop is harvested. However, the problems associated with providing credit to smallholders are numerous and include:

- Identifying and locating borrowers;
- Characterizing borrowers according to their integrity, farming ability, and potential for repayment;
- Communicating with borrowers about loan terms and conditions;
- Providing information and advice to borrowers in order to improve crop yields and loan performance;
- Verifying ability to repay at the point when repayment is due;
- Transforming in-kind repayments into cash;
- Identifying and verifying ownership of assets to be pledged as collateral; and
- Enforcing loan and default provisions through formal legal channels.

The costs associated with solving these problems can be prohibitive when the amount of the loan is small.

The high transactions costs associated with the above activities make it almost impossible for private markets to function in such a way as to provide the input marketing services to the smallholder sector. Farmer groups represent one option that has been successfully tested to lower these transaction costs.

**Use of Farmer Groups to Reduce Transactions Costs**

The development of farmer groups appears ideally suited for reducing transactions costs associated with seed distribution:

- By joining a group, borrowers self-identify as having an interest in acquiring seed;

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4 In our survey, 137 of the 255 group leaders said that less than 20% of their group owned a bicycle; 183 leaders said that less than 30% of the group owned a bicycle.
The borrowers, their creditworthiness, asset ownership and farming ability, are known to other group members;
- The group can organize meetings to disseminate information about production methods and loan contract provisions;
- Peer monitoring among group members can serve as an efficient way of monitoring ability to repay;
- The threat of loss of social standing within the group and/or the community acts as a powerful incentive for individual loan repayment;
- The group constitutes an alternative to formal legal institutions as means of enforcing contract and settling disputes;
- Once launched, the group can become self-perpetuating, as group members undertake the seed sorting, treating, and storage functions.

Operation of Farmer Seed Groups in Southern Zambia

The operation of seed groups in Southern Province of Zambia suggests that the groups were established with the specific objective of reducing the transactions costs described above. Our survey included groups organized by Africare, by church organizations, and by CARE under their Livingstone Food Security Project. Since more than 95% of groups in our survey were set up by CARE, we briefly review here how these groups operate.

Our unit of analysis is the "village management committee" (VMC). Each VMC manages one or more sub-groups. The committee is to act as a conduit between the farmers and the Area Management Committee, which in turn acts as an intermediary with the CARE organization. The village management committee performs the following functions:

- Storing seed repaid in previous years for distribution;
- Keeping records of farmer loans and repayments;
- Making decisions about whether to make certain seed loans, based on repayment histories and information about repayment capacity;
- Organizing seed requests from farmer subgroups and requesting seed (as needed after expending from VMC storage) from the Area Management Committee. The area management committee meets these requests out of its own stores, or by making a request to CARE;
- Delivering seed to farmer members;
- Making disciplinary decisions and hearing appeals in the case of non-repayment.

The rest of this paper is organized as follows. Section II presents the concept of social capital, its role in group liability lending models, and how it is expected to affect

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5 We refer to these farmer groups as "farmer seed groups." In some instances the farmer group may have been established for a purpose other than seed distribution, and therefore the members may not think of the group as a "seed group." However, we are interested in the seed distribution activities of groups, thus the terminology used here.

6 This is discussed in more detail in Associates in Rural Development (2000), CARE (1999), and Ndiyoi. et al. (2000).
repayment behavior in Zambian seed groups. The next section examines the
determinants of group repayment that are tested in the analysis. Section IV briefly
describes the primary and secondary data used for the analysis, the results of which are
presented in Section V. Section VI summarizes the main results of the paper and presents
recommendations for donors. Detailed econometric results and a description of the
answers to the field questionnaire are presented in Annexes 1 and 2.

II. Social Capital and its Applications to Group Lending Models

To the extent that farmers are mutually responsible for the repayment of each other’s seed
loans, the networks of social relations and attitudes among them—or the local social
capital—can play a central role in enforcing repayment. This section will briefly present
a simple framework for understanding social capital and apply it to the dynamics of joint
liability that underlie group repayment schemes.

A Simple Classification of Social Capital

Although the relatively recent nature of the social capital concept manifests itself in part
through ongoing definitional debates, there is widespread agreement over a broad
delineation of the concept. According to this, the social capital of a society includes the institutions, the relationships, the attitudes and values that govern interactions among people and contribute to economic and social development (Grootaert and van Bastelaer 2002a).

The concept of social capital can usefully be viewed along three dimensions, which are its scope (or unit of observation), its forms (or manifestations), and the channels through which it operates.

The scope of social capital includes the micro, meso and macro-levels, each of which is defined by an increasingly larger unit of observation. Micro-level social capital, often associated with Robert Putnam’s seminal work on civic associations in Italy (Putnam and al. 1993) focuses on networks of horizontal relationships between individuals or households, and the associated norms and values that create externalities for the community as a whole. As implicitly developed by Coleman (1990), meso-level social capital broadens the scope of inquiry to include vertical relationships as well as networks of associations, such as firms or NGOs. Finally, drawing on the work of Douglass North (1990) and Mancur Olson (1982), macro-level social capital is generally understood as including the most formalized institutional relationships and structures, such as the political regime, the rule of law, the court system, and civil and political liberties.

Macro-social factors and the social fabric of seed-providing NGOs may indirectly affect the dynamics of farmer groups and their repayment record. The focus of the present inquiry, however, is placed on the internal workings of the groups and the social
fabric of the communities in which they operate, and therefore on the micro-level scope of social capital.

Whether present at the micro, meso, or macro level, social capital can be disaggregated into two distinct forms or configurations: structural and cognitive. Structural social capital manifests itself through social networks and other structures such as associations, clubs and cultural groups, supplemented by the rules, procedures, and precedents that govern them. As such, it is a relatively objective and externally observable construct. Cognitive social is expressed by shared norms, values, trust, attitudes, and beliefs. It is therefore a more subjective and intangible concept (Uphoff 2000). Social capital in Zambian villages will be proxied both by the number of cultural, athletic, religious, political and economic groups that their inhabitants join, and by the values and attitudes that they exhibit and express.

Any form of capital—material or nonmaterial—represents an asset or a class of assets that produces a stream of benefits. The stream of benefits from social capital—or the channels through which it affects development—includes several related elements, such as information sharing, collective action and decisionmaking, and the reduction of opportunistic behavior.7

The Role of Social Capital in the Seed Group Repayment Models8

How can the above classification be applied more specifically to the design and functioning of seed group repayment arrangements in Zambia?

The use of the social capital concept is especially helpful to the design of group-based lending systems because of the almost perfect correspondence between its three above activation channels and the three severe constraints inherent to lending to poor clients in remote areas. These constraints refer to the difficulties encountered by the non-local lender in assessing individual borrowers’ repayment likelihood, in monitoring loan use and the accuracy of reports of investment returns, and finally in enforcing loan repayment.

The main innovation of group-lending programs builds on their clients’ comparative information and action advantage in dealing with the three above problems. As clients invest in the development of social networks and mutual trust, the cost of sharing information about co-borrowers’ creditworthiness, about the return on the loan-financed investment, and about their truthfulness in reporting this return, is lowered. Similarly, the ability of group members to act collectively to create pressure on potential defaulters is increased. Finally, networks, associations and social attitudes reduce opportunistic behavior by increasing the social benefits of compliance with expected

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7 See Grootaert and van Bastelaer (2002a) for a discussion of the possible negative nature of these benefits and for a presentation of the arguments for and against the use of the term “capital” to describe social networks and attitudes.
8 van Bastelaer (2000) includes a more detailed discussion of the evidence linking social capital and access to credit.
behavior (in this case, full individual loan repayment) or by increasing the social costs of noncompliance (loan default). In other words, by making all farmers collectively responsible for the repayment of the individual seed loans, the lender in effect transfers the information gathering, monitoring, and enforcement responsibilities from itself to the group.  

The stock of both structural and cognitive social capital at the micro level determines the ability of the group to successfully take on these responsibilities, and therefore to ensure high repayment rates. More specifically, the existence of large numbers of voluntary associations, collective projects, or cultural groups within a community—manifestations of structural social capital—provides fora and channels for the gathering of information about mutual repayment likelihood and seed use monitoring. The threat of exclusion from these groups is often a powerful incentive for repayment. Similarly, the structure of attitudes, mutual trust and shared cultural norms—or cognitive social capital—affects the social perception of non-compliant behavior, and therefore acts as a strong incentive for the repayment of seed loans.

In summary, the theory of—and the growing evidence on—social capital should lead us to expect that repayment rates of seed loans among Zambian farmer groups will be higher in communities characterized by higher level of associational activity, where more attention is given to shared values and opinions, and where levels of mutual trust are higher.

III. Determinants of Seed Loan Repayment

The main purpose of this paper is not to test whether the use of groups is superior to other arrangements in producing high repayment rates; rather, our focus is on the factors that make some groups more successful than others, with a particular interest in social capital at the group and community levels. To identify these factors, three sets of proxy indicators of social capital are used in the present analysis: collective action at the group level, membership in associations and networks within the community (structural social capital), and trust and adherence to norms (cognitive social capital).

1. Factors affecting collective action within groups:
A number of factors facilitate collective action among the group members, thereby increasing its ability to monitor loan use and exert peer pressure for repayment. These include:

- The size of the group: the smaller the group, the higher its ability to harness information, collective action and enforcement challenges effectively, resulting in higher repayment rates;  

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9 From the lenders’ point of view, the most effective way to enforce joint liability is to deny access to future credit to all members of the group in case of default by any of its jointly liable members. This is generally known as the contingent renewal principle.

10 The importance of group size is a central element in the microfinance literature. The Grameen Bank of Bangladesh, and most of its replications, uses groups of five persons. BancoSol groups in Bolivia usually
The age of the group and the stability in its membership: although older groups may suffer from sclerosis affecting its enforcement discipline, longer personal relationships among their members may favorably affect expectations of compliance and loan reimbursement;

Geographical proximity of members: high population density is a factor in the success of group-based lending programs, since it lowers the cost of mutual monitoring;¹¹

Joint liability;

Types of punitive actions taken by the group, the donor, or the community in the event of involuntary or voluntary non-repayment;

Training of group members in group dynamics; and

Frequency of group meetings.

2. **Proxies for structural social capital within the community:**
These proxies probe the existence and extent of:

- Levels of associational activity in the village; and
- Networks of interpersonal and hierarchical relationships, including common church participation.

3. **Proxies for cognitive social capital within the community:**
These indicators capture the levels of mutual trust and cooperation, which are explored through asking respondents about their expectations of behavior requiring mutual trust, for example in case of various emergencies (loss of income, illness,…).

Selected control variables include:

- Age, gender, education, tenure and training of the group leaders;
- Age, gender, education, health status, wealth, farming methods of group members (including fertilizer use);
- Source of seed (i.e., is it provided by outside groups or recycled from previous year’s crop?); and
- Frequency of extension visits.

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¹¹ Difficulties encountered by microfinance groups in setting up Grameen replications in the sparsely populated hills of Nepal help underscore the importance of this factor.
IV. The Data

Two types of data were collected for this research: primary or survey data, and secondary or record data. The processes and results of these two methods of data collection are described in this section.

Primary Data

255 farmer groups in the Southern province of Zambia were surveyed in the summer of 2000. Fifty-three questions were asked of the group leader, constituting part I of the survey. Part II of the survey was comprised of 24 questions, most of them identical to questions asked in part I of the survey, that were posed to a group member who was not the leader, who was chosen independently of the leader, and who answered out of his/her earshot.

Both sets of questions examined the characteristics of the groups (location, size, age and stability of groups, governance), of their leaders (age, gender, tenure, training) and of their members (age, gender, tenure, assets, incidence of HIV/AIDS, fertilizer use, plot closeness); the operations of the group (seed provenance, group constitution, extension visits); the provisions of the seed loans (joint liability, repayment history, sanctions for default); and structural and cognitive social capital in the community (associational activity, church attendance, cooperation, generalized trust).12

Secondary Data

Preliminary information received by the research team indicated that records on loans, seeding rates, yield and repayment were widely available for surveyed groups. In collecting the data, it became clear that these assumptions were largely inaccurate, and the limited availability of secondary data on repayment has affected the choice of analytical methods for this analysis. The usable secondary data set includes 118 groups for seasons 98-99 and 99-00.

Values for the repayment rates were calculated for use as the dependent variable. These were defined as the group average of individual repayment rates, or the actual seed repayment (in Kgs) divided by the repayment required under the loan contract. Approximately 7 percent of farmers received waivers for their loans; these were calculated at a repayment rate of 0. The average group rate of repayment was estimated at 52%. Ninety percent of secondary data covered CARE farmers and the ratio of females to males in the dataset is nearly 1:1. Most of the loans reported—38 percent—were in maize seed, and the average loan size was 6.5 kilograms.13

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12 A description of the results of the survey yields some basic information about the participating farmer groups, and is provided in Annex. Distribution of answers and summary statistics are available in the Annex to Leathers and al. (2001)
13 Annex 2 describes the survey findings in more detail.
V. Results

We use the seed repayment rates in the 98-99 and 99-00 seasons as our dependent variable. In order to maintain as high a number of observations as possible, we make the reasonable working assumption that the survey answers are generally consistent for the last two years, so that the answers obtained in 2000 are generally the same as those that would have been obtained if we had run the same survey in 1999. To account for systematic differences in repayment rates from year to year, we include year dummies in each regression.

The discussion of the last sections identifies four categories of variables that may influence the performance of farmer groups:

- Factors affecting collective action within groups.
- Proxies for structural social capital within the community.
- Proxies for cognitive social capital within the community.
- Control variables.

In all, there are some 80 factors about which we have information that may influence the performance of farmer groups. The fact that we have repayment rates for 118 groups means that we are faced with a severe degrees of freedom problem. In order to partially alleviate this concern, we begin by examining the impact of these causal factors category by category. In effect we are conducting six individual analyses on the variables in each category that have a significant effect on group performance. Based on these results, we select a subset of the variables that are significant in category-by-category regressions for inclusion in an all-categories regression.\(^\text{14}\)

The results of this overall regression are presented in Annex 1, and discussed below according to the three categories described in Section III.

1. Factors affecting collective action within groups:
   - The size of groups (whether or not the group received 12 or fewer loans) has a highly significant and positive impact on performance, with smaller groups performing better. The finding that smaller groups are more effective at gathering information about its members’ seed use and at enforcing repayment is consistent with our expectations and the literature on group lending.
   - The age of the group (how long the group has been operating), an important determinant of performance in the analysis of group characteristics, does not seem to affect repayment. Since group membership is relatively fluid, it is likely that the frequent influx of new members prevents the groups to reach a sclerosis stage that affects their repayment performance.
   - The distance between group members’ houses and fields does not appear to impact the group’s repayment record, suggesting that members do not significantly rely on

\(^{14}\) Description and tables of the six category-by-category regressions are available in Leathers et al. (2001). The categories are: group characteristics, group operations, characteristics of group members, characteristics of the group leader, characteristics of the loan contract, and community-level social capital.
mutual observation of seed use and yield to enforce repayment discipline. Superstitious beliefs in witchcraft discourage villagers from observing each other's plots, since villagers may fear reprisals from envious neighbors. Similarly, a person who is too curious about a neighbor's plot may be suspected of witchcraft in the event that the observed plot experiences crop failure. This prevalent belief in witchcraft may also help explain most respondents' preference for farming alone over farming with another person (even with potentially higher individual returns).

- The coefficient on "group liability" is positive but not significant at the 90 percent level. Joint liability provisions are associated with higher repayment rates, but our findings fail to confirm the expected result that peer pressure among groups is a powerful tool to ensure loan repayments.

- Default provisions on repayment do not have a significant impact on repayment behavior. Two dummy variables are introduced to examine how repayment is affected by the threat of expulsion or other punitive action taken against members who default involuntarily because they are unable to repay. Similarly, two dummy variables explore the impact of expulsion or other action imposed upon members who are able, but unwilling, to repay. None of the four dummy variables is significant at the 90 percent significance level. The low empirical importance of the punitive actions suggests that NGOs may suffer from credibility problems when it comes to enforcement of repayment commitments. Evidence from microfinance programs suggests that NGOs believe that their long-term goals are better served by giving members a second chance than by cutting them off altogether or seizing some of their assets.\(^{15}\)

- The training of the group leader in team management techniques, and the training of the group members in communication and cooperation techniques, do not appear to impact the group's performance.

- Contrary to the expectation that a higher number of group meetings provides more opportunities to members to monitor their mutual seed use and repayment ability, the coefficient on number of meetings of the group is significant and negative. One possible explanation of this finding is that meetings are more common in groups in which crisis conditions cause widespread non-repayment.

2. Proxies for structural social capital within the community:

- Measures of structural capital, as proxied by the number of political, athletic, or cultural groups in study villages, are insignificant. This result, which is at odds with mainstream findings of the social capital literature, may reflect the fact that Zambian villagers rely more on informal forms of social interactions, traditions and customs than on established associations to build the trust and common values that underlie the behavior of farmer groups.

- Membership in the same church is inversely correlated with repayment performance. This finding, supported by anecdotal evidence, suggests that the exceptionally strong bonds among members of the same church are not conducive to peer monitoring and reimbursement pressure, resulting in lower repayment rates.\(^{16}\)

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\(^{15}\) See Matin (1998) for the description of a similar approach to default within the Grameen Bank.

\(^{16}\) This finding implicitly suggests an inverted U-shape relationship between cognitive social capital and peer pressure. Too little social capital hurts information collection and collective action, resulting in weak
3. Proxies for cognitive social capital within the community:
One of the generally accepted indicators of generalized trust (trust toward strangers) is the respondent’s perception that “people can generally be trusted” or that “you can’t be too careful”. This central element of cognitive social capital is captured in the present study by the question “are villagers likely to take advantage of each other?”. This variable features significantly in the regression analysis, and its sign indicates that the lower the level of such “predatory behavior”—or the higher the level of generalized trust—in the village, the higher the seed repayment rates in that village’s groups. The existence of higher cognitive social capital in a village thus appears to create stronger incentives for its citizens to live up to their commitments, in this case in terms of repayment of seed loans.

Coefficients for selected control variables provide some insights into other factors that may or may not shape repayment behavior among seed groups.

- Age and education of group leaders have no significant impact on group performance. However, the data suggests—but only at 89 percent significance level—that leaders who have spent more years away from the village are less effective at enforcing loan repayment in their groups. They may find that this experience is valued when the group is choosing a leader, but that the time away from the village has weakened the bonds between the leader and other villagers, decreasing their authority and ability to affect group behavior.

- The gender variable is insignificant when crop decisions are included in the analysis. This finding reflects the fact that women's groups planted higher quantities of groundnuts and cowpeas seed, which performed relatively poorly during the years surveyed. In addition, the survey team notes that women planting maize were frequently heads of single parent households, and they experienced labor shortages at critical times in the growing season.

- The impact of HIV/AIDS does not appear to affect group operation, although more than half of the respondents described the epidemics as a major problem. This result can probably be explained by the fact that new members join a group if existing members become sick, leaving the size and the operation of the group largely unchanged. The survey team also reports the common practice of AIDS-infected people in cities returning to their village to die. Thus death from AIDS can be perceived as a large problem in a village even when it does not directly affect the performance of group members.

- The extent of ownership of assets such as radios, bicycles, cattle and goats by group members is negatively and associated with repayment performance at the 90% significance level. Ownership of radios, bicycles, and goats (and total asset ownership) is higher in the Kalahari zone, where growing conditions are relatively poor. Thus the negative impact of assets could be reflecting some impact of growing conditions that is not captured in our agroecological zone dummy variable.
Groups that get seed from outside organizations perform better than those that distributed seed saved from the previous year’s crop. There are two possible explanations for this result. The newly provided seed may be of higher quality, leading to better yields on average, and higher repayment ability. The obligation of the group to an outside entity may also provide an additional incentive for repayment.\(^\text{17}\)

Not surprisingly, repayment is strongly affected by the number of visits by an extension agent or a representative from the organizing entity, and by the use of fertilizer.

**Cultural Constraints to the Effectiveness of Social Capital?**

Group-based lending relies on the comparative advantage that groups of collectively liable borrowers have over the lender in addressing information asymmetries related to the selection of co-borrowers, the monitoring of co-borrowers’ loan use, and in enforcing repayment. The results presented in this paper suggest that seed groups in Zambia build on this comparative advantage to enforce repayment. They also indicate that, all other things equal, fear of superstition and exceptionally strong church-based personal bonds can significantly weaken the ability of social capital to address these asymmetries and to enforce repayment discipline.

These results suggest that the intensity of the impact of social capital on repayment behavior can be significantly dulled or sharpened by a number of cultural elements. Aryeetey (1996), for example, suggests that, in some parts of rural Africa, the pressure to repay a loan is directly linked to the fact that credit and debts are intensely private issues, and as a result is most effective in view of the risk of being exposed as a debtor. Hence, under credit mechanisms that are communal and transparent, such as group lending, the shame of being exposed is diminished, along with the collective pressure to repay. In other regions, however, such as the villages in Cameroon where Van den Brink and Chavas (1997) studied ROSCAs, members claim that “not even death is an excuse” for default.

Future work on social capital and group lending may want to explore more deeply how cultural constructs can affect the performance of collective liability programs, and how they can be included in their design and operations.\(^\text{18}\)

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\(^{17}\) van Bastelaer (2000) indicates however that, in the area of rural finance, the intensity of social pressures for loan repayment is often higher when lending capital is locally raised (as in ROSCAs) than when it is provided by external sources (microfinance NGOs).

\(^{18}\) An anonymous reviewer points out the possibility that groups may collusively decide to default deliberately in order to take advantage of the organizing entity (CARE in this case). We don’t believe that the evidence support this view, for a number of reasons. A principal objective of CARE in establishing the seed groups was they would become self-sustaining, or that repayments would be distributed as seed the following season. At time they were formed, groups were warned by CARE that failure to achieve sustainable repayment rates would result in the group being eliminated from the CARE project. (See CARE, 1999.) Our survey (Annex 2) indicates that this message was clearly communicated: nearly 80% of respondents said that if one group member failed to make repayment, other group members were responsible. In addition, visits from CARE representatives reduce the possibility of collusive moral hazard
A Note about Endogeneity

Concerns about endogeneity are a recurrent and important element of empirical research on the impact of social capital on poverty. A growing number of studies indicate that participation in local organizations and/or high levels of mutual trust increase household incomes. Could it also be that higher income households—which supposedly have more leisure time—enjoy higher participation in associations and higher levels of mutual trust? If so, social capital would be a consumption good, and the causality between social capital and income could run in both directions, weakening any policy conclusions about the importance of social capital for poverty alleviation.

What is the relevance of this discussion for our study of seed loan repayment in Zambia? The results presented here strongly suggest that the higher the levels of cognitive social capital within a community, the higher the repayment rates among this community’s seed borrowers. Can a case be made that the reverse causation is also active, i.e., that higher repayment rates can lead to higher levels of social capital within a community? There are several possible channels for this causation, but the most likely draw on the relation discussed above. In other words, if higher individual repayment rates contribute to higher borrower wealth, and higher wealth in turn provides more leisure time with which to build social capital at the community level, reverse causation could affect the results presented above.

Testing this hypothesis as part of this study would meet at least two obstacles. First, the variation in the levels of asset holdings among households in our sample is very limited (most of them are subsistence farmers), greatly affecting the reliability of any statistical results that use this variable. Second, the test would need to take into account the non-trivial time lags imbedded in the causality chain. The effects of full loan repayment by individual borrowers in one year—assuming they are not one-time events—would likely take several years to affect their households’ assets holdings. This increased wealth would, in turn, also not have an immediate impact on social interactions and social capital at the community level. Should sufficient time series data be available, instrumental variable estimation or the introduction of historical social data in our regression equation would help us determine whether reverse causation affects our analysis. Given the limited historical coverage of our data, however, this approach would be a central element of any follow-up work, provided it has access to more complete time series data than we do.

by the group as a whole (over half of the groups reported visits from the CARE representative once or twice a month).

19 See Narayan and Pritchett (1997); Grootaert (1999); Grootaert, Oh and Swamy (1999); and Grootaert and Narayan (2000).

20 The studies mentioned in the previous footnote rely on instrumental variables estimation or historical social capital data to determine that the causality between social capital and welfare runs from the former to the latter, suggesting that endogeneity of social capital is not an issue in their samples.
VI. Conclusion and Lessons for NGOs and Donors

The purpose of this paper is to identify the factors that are associated with relatively good repayment performance of farmer groups in Southern Zambia, in particular those identified in the growing literature on social capital.

The existence and continuing operation of farmer seed groups indicate that they can succeed where private markets fail. Undoubtedly, this success is a result of lower transactions costs, compared to private firms. But all farmer groups are not equal. Some are relatively successful at enforcing repayment; and others are less successful.

The results suggest that some factors facilitating collective action within seed groups, such as its size, are associated with higher repayment performance. The age of the group and the distance between members’ houses and plots does not appear to affect repayment, largely because of membership fluidity and fear of witchcraft, respectively. The frequency of group meetings negatively affects repayment rates. This suggests that, rather than being a determinant of group performance, the number of meetings may actually be an indicator of it.

Measures of structural social capital such as participation in associations and networks fail to explain group repayment behavior, with the exception of membership in the same church, which is negatively related with repayment rates. This result suggests that the strength of bonds linking co-parishioners may override the peer pressure expected from members of the same seed group.

Cognitive social capital, proxied here by trust toward strangers, is strongly associated with repayment performance. This suggests that attitudes and values shared by community members create an environment in which seed borrowers put value in honoring their engagements.

Factors independent of social capital, but that nevertheless affect repayment behavior, include seed source (internal vs. external), length of leader’s local residence, asset ownership, frequency of extension visits, and fertilizer use. Gender of group members and HIV/AIDS incidence do not appear to affect default rates.

The above results offer a number of suggestions on how to improve the design and operations of seed distribution systems. These should be considered with a level of prudence consistent with the small size of our sample.

The data confirm that the role of NGOs in providing seeds from the outside—rather than encouraging the use of previous years’ crop grains as input—results in higher agricultural performance. Although one of the objectives of the NGOs is to create self-sustaining seed groups, we believe that additional effort to improve seed production techniques or efforts to improve group access to fertilizer and extension information will improve farmer yields and therefore repayment performance.
Equally important, the study indicates that a sustained focus on relatively small groups (for example, with less than 12 members) may increase the efficiency of the group dynamics and further increase repayment rates.

The study also suggests that NGOs may observe higher repayment rates in seed groups led by individuals who have spent most of their life in the community. Similarly, NGOs may want to discourage the inclusion of same-family and same-church members in the seed groups.

NGOs and donors are not in a position to directly influence the level of social capital—in particular, mutual trust—within the communities where they set up seed groups. The use of available tools to measure cognitive social capital, however, may help point to villages where the pre-existing level of mutual trust increases the likelihood of higher repayment rates among seed groups.

Although no crop is shown to consistently perform better than other in our survey, further efforts are necessary to identify and promote adoption of crops that are better suited to the dry conditions and poor soil of the Kalahari. Similarly, because of the differences in agroecological conditions in the area covered by the NGOs, there may be a need to develop expected repayment rates that reflect these differences.

Finally, the data also suggest that resources directed toward establishing written group constitutions, training group leaders in management techniques, and instruct group members about ways to communicate and cooperate, may be better used in other aspects of the seed loan programs.

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21 As the poorest of the poor traditionally exhibit a level of risk aversion that prevents them from entering into any debt arrangement, they are usually unattractive clients for group-liability credit programs. There is no apparent reason to believe that these incentives are different among the poorest Zambian farmers, and that a drive to include them in seed groups would necessarily be successful.

22 See, for example, Grootaert and van Bastelaer (2002b) for the description and instruments of a field-tested toolkit to measure social capital at the household, community and organization level.
### Annex 1: Econometric Results

| Variable                                           | Coefficient | Standard Error | T-statistic | P>|t| |
|----------------------------------------------------|-------------|----------------|-------------|------|
| **Factors affecting collective action within groups:** |             |                |             |      |
| Group size (less than 12)                           | 0.201       | 0.089          | 2.245       | 0.028|
| Group age                                           | 0.049       | 0.058          | 0.852       | 0.397|
| Group stability                                     | -0.054      | 0.096          | -0.566      | 0.574|
| Distance between houses                             | -0.014      | 0.062          | -0.232      | 0.818|
| Distance between fields                             | 0.047       | 0.057          | 0.835       | 0.407|
| Group liability (1 = yes)                           | 0.138       | 0.150          | 0.923       | 0.359|
| Dummy for expulsion if involuntary default          | 0.094       | 0.133          | 0.704       | 0.484|
| Dummy for other punitive action if involuntary default| -0.144     | 0.200          | -0.717      | 0.476|
| Dummy for expulsion if voluntary default            | -0.172      | 0.116          | -1.479      | 0.144|
| Dummy for other punitive action if voluntary default | 0.257       | 0.373          | 0.688       | 0.494|
| Group dynamics training                             | 0.086       | 0.163          | 0.527       | 0.600|
| **Group meeting frequency**                         | **-0.142**  | **0.067**      | **-2.115**  | **0.038** |
| **Proxies for structural social capital within the community:** |             |                |             |      |
| Existence of other farm groups in community (1 = yes) | -0.041      | 0.109          | -0.377      | 0.707|
| Existence of economic groups in community (1 = yes)  | 0.202       | 0.127          | 1.598       | 0.115|
| Existence of cultural groups in community (1 = yes)  | -0.026      | 0.097          | -0.264      | 0.793|
| Existence of sports groups in community (1 = yes)    | 0.023       | 0.136          | 0.172       | 0.864|
| Existence of church groups in community (1 = yes)    | **-0.383**  | **0.177**      | **-2.159**  | **0.035** |
| Existence of political groups in community (1 = yes)  | 0.069       | 0.113          | 0.610       | 0.544|
| **Participation of group members in same church**     | **-0.237**  | **0.116**      | **-2.044**  | **0.045** |
| **Proxies for cognitive social capital within the community:** |             |                |             |      |
| Independence vs. collaboration                      | -0.129      | 0.130          | -0.987      | 0.327|
| Trust in villagers vs. outsiders                    | -0.093      | 0.133          | -0.698      | 0.488|
| Generalized trust (inverse of predatory behavior)    | **0.226**   | **0.101**      | **2.250**   | **0.028** |
| Attention to the opinion of others                  | -0.049      | 0.078          | -0.625      | 0.534|
Selected control variables:

<table>
<thead>
<tr>
<th>Variable Description</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Dummy for agroecological zone</td>
<td>0.268</td>
<td>0.117</td>
<td>2.299</td>
<td>0.025</td>
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<tr>
<td>Group leader’s age</td>
<td>0.004</td>
<td>0.004</td>
<td>1.019</td>
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<tr>
<td>Group leader’s education level</td>
<td>0.079</td>
<td>0.072</td>
<td>1.099</td>
<td>0.276</td>
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<tr>
<td>Group leaders’ years away from community</td>
<td>-0.005</td>
<td>0.003</td>
<td>-1.565</td>
<td>0.123</td>
</tr>
<tr>
<td>Leader training in group management</td>
<td>0.111</td>
<td>0.139</td>
<td>0.796</td>
<td>0.429</td>
</tr>
<tr>
<td>Gender of group members (higher number means more women)</td>
<td>-0.041</td>
<td>0.049</td>
<td>-0.839</td>
<td>0.405</td>
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<tr>
<td>HIV/AIDS as major problem (1 = yes)</td>
<td>-0.001</td>
<td>0.088</td>
<td>-0.003</td>
<td>0.998</td>
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<tr>
<td>Asset ownership (cattle, goats, radio, bicycle)</td>
<td>-0.007</td>
<td>0.004</td>
<td>-1.692</td>
<td>0.096</td>
</tr>
<tr>
<td>Fertilizer use</td>
<td>0.009</td>
<td>0.005</td>
<td>2.012</td>
<td>0.048</td>
</tr>
<tr>
<td>Provenance of seed (1 if external only, 2 if external and internal, 3 if internal only)</td>
<td>-0.097</td>
<td>0.048</td>
<td>-2.025</td>
<td>0.047</td>
</tr>
<tr>
<td>Frequency of extension/NGO visits (1 = most frequent, 5 = least frequent)</td>
<td>0.146</td>
<td>0.078</td>
<td>1.862</td>
<td>0.067</td>
</tr>
<tr>
<td>Dummy for sorghum-millet combination cultivation in 1999-2000</td>
<td>-0.753</td>
<td>0.770</td>
<td>-0.978</td>
<td>0.332</td>
</tr>
</tbody>
</table>

N 118
F(52, 66) 7.14
Prob > F 0
R² 0.8576
Adjusted R² 0.7374

Note: Variables listed in **bold font** indicate significance at the 95% level; variables listed in *italic* indicate significance at the 90% level. The actual significance levels are 1 minus the figure in the column P>|t|.

In addition to the last variable listed, many other crop and year dummies were included in the regression. The coefficients on all of these were not significant and the results are not shown. Complete regression results can be obtained from the authors.
Annex 2: Description of Answers to Survey Questions

Characteristics of the Group

The vast majority of groups surveyed (93 percent) were affiliated with the CARE seed distribution scheme. Small numbers also came from Africare (6 percent), PAM (0.8 percent) and other schemes. Most groups came from the Kazungula district (89 percent) with small numbers also coming from Kalomo (3 percent), Choma (3 percent) and Livingstone (3 percent), as well as several other districts. For 66 percent of the surveyed farmer groups, the nearest town with a railroad line was Livingstone. This was followed by Zimba (25 percent), Kalomo (5 percent), Choma (3 percent) and other towns in very small numbers. The average distance to this town was 44.7 ± 17.4. 23 Respondents typically farmed on a plateau/escarpment (53 percent) or kalahari (46 percent).

95 percent of the groups surveyed had been in existence for 2 years or more, and 59 percent for more than three years. 96 percent of groups started because the organizing entity contacted farmers in the area and asked about interest in forming a farmer group. The stability of groups varied widely across those surveyed, with the most common leader answer (41 percent) being that some original members had left the group and some new members had been added. The average size of the group was 21.5 members ± 15.0. Roughly half of both leaders and members said that their group had a written constitution. 95 percent of group leaders had been chosen by a group vote. 70 percent said that the village headman was a member of their group, and 17 percent said that the headman was not a member, but would assist the group whenever asked.

Characteristics of Group Operations

Half of the respondents reported that seed is obtained by saving it and distributing it the following year, while 36 percent said that it is received from an outside entity and repaid at harvest. 96 percent of leaders surveyed said that groups distributed the seed to their members who plant it on their own individual plots. 85 percent of those surveyed said that their groups had entered into a formal or informal contract with the supplier of seeds. 54 percent of respondents said that during the last crop year, members of their group were visited by representatives of the organizing entity or by the government once or twice a month. 25 percent said that they were visited less than once every two months. 64 percent said that on average their groups met once or twice a month.

Characteristics of the Group Members

58 percent of surveyed members and leaders said that they knew all of the farmers in their group before the group was formed, 28 percent said that they had known most. 79 percent said that they had not belonged to farmer groups other than the group they were in. Approximately 72 percent of surveyed members were male. When describing the

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23 The x ± y notation here and following is used to indicate the mean (x) and the standard deviation (y) of the variable.
gender of the respondents, 38 percent of group leaders said that their groups were mostly men, 30 percent mostly women, and 31 percent about equal numbers of each. Very few respondents said that their group was all men, and none said that their group was all women. 53 percent said that a member of their group had died during the last year and of this group, the average number of deaths was $2.1 \pm 1.2$. 59 percent said that HIV/AIDS is a problem. When asked how many members of their group had a radio, the average response was that $4.2 \pm 3.5$ of their members did. Comparable answers were given for bicycles and cattle. On average, surveyed leaders reported that $1.5 \pm 3.0$ of their members used fertilizer.

42 percent of the responding members said they had been a member of their group for more than three years, 27 percent said they had been members for 2 years, and 20 percent said they had been members for 3 years. The majority of respondents, 85 percent, said that the members of their group lived in the same village. 47 percent said that their plots are so close together that other members of their group knew what was happening on their plot during the year, 36 percent said their plots were so far apart that other members did not know the conditions of their plot unless they made a special trip, and 17 percent said that the situation was about half the former and half the latter.

**Characteristics of the Group Leaders**

Group leaders said that their average age was $42.4 \pm 12.8$; 86 percent of them were male. 55 percent of the surveyed group leaders had some formal education to grade 7 or less and 38 percent had an education up to grade 12. On average, group leaders had held that position for $3.1 \pm 1.4$. 44 percent had lived in their village their whole lives. For those who hadn’t, the average number of years they had lived outside of their village was $23.3 \pm 13$. 59 percent of surveyed members and leaders said that they knew all of the farmers in their group before the group was formed, 30 percent said that they had known most. 72 percent said that they had not belonged to farmer groups other than the group they were in and 76 percent said that they had not had any previous experience as a leader of a farmer group. 72 percent of surveyed group leaders said that they had received training about how to lead a farmer group from the organizing entity, while 24 percent said that they had not received training.

**Seed Loan Provisions**

63 percent of respondents said that the group as a whole is held responsible if one of the group members is unable to make the required repayment, while 33 percent said that the individual farmer is held responsible. 64 percent of respondents said that one or more members of their group were unable to make the required repayment in the previous year.

The following questions regarding loan defaults were answered based either on past experience with farmers that had defaulted, or on what respondents thought would happen in that case. When asked if the defaulting person was requested to make part of the repayment to the extent possible, 62 percent responded negatively. 71 percent said that the person was asked to repay in seed other than the seed borrowed; 75 percent
indicated that the person was asked to pay in cash or in another seed. If a member of the group was unable to make the full repayment, 46 percent said that the member was warned that future non-repayment would result in being asked to leave the group; 23 percent said that the member was not permitted to participate in the group in the future. When asked what would happen if a member of the group that refused to repay the loan even though he/she was able to repay, 48 percent said that the person would be expelled from the group; 14 percent of members said that legal action would be taken; while 30 percent of members said that some other action would be taken. 78 percent of responding members said that if one or more group member fails to make required repayments, other members are required to increase their repayments to make up the difference. 93 percent of responding members said that action would be taken to ensure that a person who claimed that they were unable to repay was telling the truth.

Social Capital in the Village or Community

37 percent of respondents reported that their village or community had other farmer groups formed for purposes of improving farming capabilities; 21 percent said that there were other economic groups formed for the purpose of increasing the value of non-farm production. 84 percent of leaders said that there was an athletic group or sports group in their village or community; 94 percent said that there was a religious group who met regularly for worship; 42 percent said that there was a cultural group that met regularly; and 77 percent said that there was a political group. 16 percent of respondents said that the members of their group did not all belong to the same church. 72 percent thought that if someone in their village had the choice, they would farm 2 limas of land entirely by themselves, while 29 percent said that they would farm 5 limas of land jointly with one other person. 62 percent said that the statement “people in this village/neighborhood are likely to take advantage of you” was true of a small number of villagers.
References


