Contingent Loan Repayment in the Philippines*

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Abstract

Using data from the Philippines, this paper seeks to understand how households in the study area apparently manage to avoid falling in a debt trap in spite of frequent borrowing. Findings suggest this is achieved via three institutional features. First, most informal debt carries no interest. Second, for all debts, repayment is postponed in case of borrower's difficulty; this is the only insurance feature of debt repayment. Third, while debt principal is seldom forgiven or reduced, interest-bearing debt does not carry additional interest if debt repayment is delayed. This prevents interest charges from accumulating and debt from snowballing.

JEL classification code: G19, K12, O12

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1. Introduction

Risk is part of life. The way people and firms deal with risk therefore affects many aspects of economic activity. This is true everywhere, but is particularly marked in poor rural economies where the magnitude of risk is larger and individual capacity to deal with risk is less (Fafchamps 1999). Economic agents have devised a variety of strategies to cope with risk, such as transfers, precautionary savings, or risk pooling (e.g. Townsend 1994, Morduch 1995). We focus here on one of these strategies: borrowing.

It is increasingly recognized that credit plays an important role in the way people deal with risk By taking up a new loan, individuals can smooth their consumption in response to shocks. Fafchamps and Lund (2003), for instance, show that rural Filipino households borrow from friends and relatives when affected by income or health shocks.

Borrowing to deal with shocks is a double-edged sword. As individuals or firms borrow to meet immediate cash needs, they run the risk of falling into a spiral of debt – or debt trap. In developed economies, the growing indebtedness of large segments of the population has begun to attract the attention of the press. Bissuel (2003), for instance, estimates that up to 200,000 French households are so much in debt that they will never be able to repay what they owe (e.g. Banque de France 2001, DREES 2003). Similar trends have been noted in the US where debt relief is nevertheless available as individuals can file for personal bankruptcy (e.g. Maki 2000, Lawless 2002). The advent of debt traps at the individual or household level has long been documented and discussed in the development literature, often in relation with patronage and labor bonding (e.g. Srinivasan 1989, Platteau 1995, Genicot 2002).

Contingent loan repayment has been discussed extensively in the literature – most notably in the literature on sovereign debt where debt repayment is often renegotiated (e.g. Eaton and Gersovitz 1981, Kletzer 1984). What remains unclear is how the contingent repayment of

informal loans is organized. Is it through delay in repayment (debt rescheduling), reduction in repayment (partial or complete debt forgiveness), or issuance of new debt (debt roll-over)? Under what circumstances does payment in kind or in labor replace payment in cash? Do lenders take advantage of borrowers' difficulties to force them into a debt trap, sometimes called debt peonage or labor bonding in the literature?

The purpose of this paper is to provide elements of answer to these questions by drawing on empirical evidence from Ifugao, a highland community of the Philippines. The data, collected over a period of 9 months, include detailed information relative to all loans and loan repayment. Data were also collected on shocks affecting respondents and their lenders. We find that most informal debt carries no interest rate – in spite of non-negligible inflation. As we show in the conceptual section of this paper, charging zero interest makes a debt trap impossible. Second, for all debts, repayment is postponed in case of borrower's difficulty – a result that is consistent with Udry (1990)'s description of informal lending in Northern Nigeria. Although interest charges are not always paid in full, the principal itself is seldom forgiven or reduced, in contrast to what Udry seems to imply in his analysis.[1] Third, interest-bearing debt does not carry additional interest if payment is postponed. The importance of the latter point has, we believe, not been recognized in the literature. Combined with debt postponement, it prevents interest charges from accumulating and debt from snowballing while providing relief for debtors in difficulty. Finally, we find some evidence that debtors unable to repay in cash volunteer their labor as repayment. But, as far as we can judge, this practice is not associated with labor bonding in the survey area.

Taken together with the earlier results of Fafchamps and Lund (2003), these findings depict an economy in which informal credit is widely used as a way to deal with shocks but in which

[1] According to the data, for only 6.3% of the loans (be they formal or informal), what the borrower plans to repay is lower than the principal of the loan.

safeguards exist that make falling into a debt trap unlikely.[2] This is consistent with descriptions of the study area by social scientists (e.g. Barton 1969, Conklin 1980, Russell 1987) who find it more egalitarian than surrounding rural communities in the Philippines and East Asia in general (e.g. Geertz 1963, Scott 1976, Hayami and Kikuchi 2002).

The paper is organized as follow. We begin in Section 2 by providing a conceptual framework for contingent loan repayment. We examine the conditions under which debt trap or labor bonding are likely to arise. Forms of contingent repayment are contrasted with the help of a simple model. We show that debts based on the continued voluntary participation in long-term relationships are more likely to resort to debt rescheduling rather than debt roll-over. In a perfect risk sharing equilibrium, gifts and transfers should be made to help pay off debts. Section 3 discusses the data collection methodology. A simple test of contingent repayment is presented in Section 4. A more detailed analysis of the forms of contingent repayment appears in Section 5.

2. Conceptual Framework

To most people a loan is a simple contract: what is stipulated in the contract is what is due, and what is due is what is paid – unless there is default in which case parties go to court. As we will see, in our study area things do not work like this: what is regarded as due is not always what is stipulated in the contract, what is paid is not always what is due – and yet debtors are hardly ever considered in default and no one ever goes to court. How can we make sense of this?

The 'standard' view of debt contracts works well in an institutional environment in which loan contracts are regulated and enforced by courts.[3] Outside this environment, it is not as useful

[2] A few observations in the sample report having mortgaged their land in order to obtain consumption credit. This may be a prelude to distress land sale. Unfortunately, we do not have enough observations to draw inference regarding these isolated cases.

[3] E.g., penalty clauses and contractual interest rates are regulated by law, and many borrowers – such as banks

and may even become a hindrance. To make sense of our study area, we must 'deconstruct' the concept of debt and rebuild it from the ground up. To help us in our endeavour, we can fortunately enlist the help of a voluminous literature on repeated games, sovereign lending, and risk sharing.

Imagine individual i borrows from individual j. What induces i to repay? Basically two types of penalties can be imposed by j: penalties that are internal to the relationship between i and j, such as exclusion from future exchange; and penalties that involve third parties, such as court action. The standard view of debt contracts relies on external penalties. Yet there are many circumstances in which such penalties are not implementable, for instance because the borrower is a sovereign[4] or because the threat of external penalty is not credible.[5] In those cases, respect of the contract must be enforced internally.

As Bulow and Rogoff (1989) have clearly shown in the context of sovereign debt, a pure debt contract cannot be enforced internally if assets exist.[6] But a contract that combines debt and insurance can be self-sustainable if cheaper sources of insurance are not available (e.g. Eaton and Gersovitz 1981, Grossman and Van Huyck 1988).[7] This means that debt contracts that are enforced via repeated interaction must allow contingent repayment.

This simple yet powerful observation is at the core of our empirical analysis. But it is also a source of difficulty: contingent repayment in a long-term relationship creates confusion in the

– are subject to prudential regulation.

[4] Public debt is ultimately not enforceable by courts because public property cannot be seized to pay for private debt.

[5] For instance because breach cannot be proved to an external osbserver, the debtor has no assets to foreclose upon, or the debt is too small to justify the financial and time cost of court action.

[6] This can be shown in two steps. First, we note that the promise of an increase in future lending could induce repayment but is not credible. To see why, suppose it is. Then the debt needs to increase infinitely in order to continue to induce repayment. This ultimately violates the borrower's intertemporal budget constraint (as in a Ponzi game or pyramid scheme). By backward induction, this implies that an increasing debt is not subgame perfect. Second, if B does not increase over time, then it is better for the borrower to invest rather than repay the lender. This is true whenever the return on the asset is greater than $-r/(1+r)$, which is satisfied for any asset with a non-negative return.

[7] Provided the borrower does not have access to insurance at better conditions from elsewhere (Bulow and Rogoff 1989).

terminology of debt contracts. This is because the long-term relationship in which the debt contract is embedded blurs the distinction between the payment of principal and interest on the one hand, and the contingent transfers that serve an insurance role on the other. To see why, imagine that i owes $B(1+r)$ to j but has suffered an income shortfall ε below average income y. The voluntary repayment constraint of i is:

$$U(y-\varepsilon-B(1+r)+\tau)-U(y-\varepsilon)\geq EV \tag{2.1}$$

where τ is an insurance transfer from j to i and EV denotes the expected future gain to i of the relationship with j. Inequality (2.1) puts an upper bound on total net payment $\tau - B(1+r)$. To tie down τ, we can for instance suppose that the lender chooses the smallest possible transfer so that inequality (2.1) is just satisfied. More detailed analyses of this category of models can be found in Ligon, Thomas and Worrall (2000), Foster and Rosenzweig (2001), and Kletzer and Wright (2000).

Equation (2.1) does not produce clear testable predications regarding the form taken by contingent debt repayment. The problem is that transfer τ can take multiple forms. It could be a direct transfer in cash or kind. But it could also take the form of a reduction in principal B (debt forgiveness), postponement in debt repayment (debt rescheduling), or issuance of new debt to repay old debt (debt rollover). In debt roll-over, τ is regarded as new debt, due next period, i.e., $B_{t+1}=\tau_t$. If the debtor pays nothing, $B_{t+1}=B_t(1+r)$ – interest is compounded and the debt snowballs. In debt forgiveness, τ is regarded as a deduction from the principal, so that $B_{t+1}=B_t(1+r)-\tau_t$. As long as $\tau > rB_t$, the stock of debt falls. Debt rescheduling is basically an intermediate situation between debt roll-over and debt forgiveness. In our simple example, it corresponds to the situation where interest charges are waived $\tau = rB$ but the stock of debt remains unchanged, i.e., $B_{t+1}=B_t$.

Following Kocherlakota (1996), Kletzer and Wright (2000) and Ligon, Thomas and Worrall (2001), Fafchamps (1999) has shown that, in models such as these, the equilibrium interest rate often is indeterminate and must be set exogenously. This is because any change in r can be matched by a corresponding change in τ without any change to net flows of funds between i and j. One focal point is to set $r = 0$.[8] With zero interest, there cannot be a large build-up of debt since any finite debt is paid in finite time. With $r = 0$ borrower and lender switch roles over time; the relationship between them is egalitarian.

A different situation arises whenever the ultimate objective of the lender is to force the debtor into a debt trap, for instance to take his land or to force him (and his family) into bonded labor or debt peonage.[9] In that case, it is in the lender's interest to let the (nominal) debt accumulate as fast as possible, for instance by charging a high interest rate, by compounding interest, and by opting for debt roll-over instead debt forgiveness.[10] Of course, it is not in the borrower's interest to accept such a contract whenever alternative sources of credit or insurance are available. But for those borrowers without alternatives, usury and debt peonage are still better than starvation (Srinivasan 1989). To protect vulnerable borrowers, laws and social norms may therefore set limits on contractual interest rates.[11] These issues are discussed more in detail in Fafchamps (2003), Chapter 4.

To summarize, theory predicts that debt contracts enforced through repeated interaction must include contingent debt repayment. It also predicts that if alternative sources of insurance

[8] As equation (2.1) shows, there is a limit to how much repayment j can receive from i in a self-enforcing way. Whenever $r > 0$, debt build up is possible. The larger r is, the faster the stock of debt rises and the faster the parties reach the point where $B(1 + r)$ exceeds what i is willing to pay. At that point B needs to be partially forgiven. Setting $r = 0$ minimizes the need to renegotiate B.

[9] Debt peonage corresponds to a situation in which the debtor owes a large nominal debt that can never be repaid but is used by the lender to extract recurrent payments over a long period of time.

[10] Competition among creditors may also induce them to raise interest charges in order to claim a larger share of the debtor's assets during bankruptcy procedings. Since this case does not apply here, we need not discuss it further.

[11] Good examples of such restrictions include the moral condemnation of usury found throughout medieval christiandom and islam, and current day legal limits on penalty clauses and admissible interest charges in various contracts.

exist, lenders are unable to charge usurious interest rates. In this case, a zero interest rate emerge as a natural equilibrium. Contingent debt repayment takes the form of debt forgiveness – or perhaps debt rescheduling. Debt build-up is unlikely and parties switch roles over time. In contrast, if alternative sources of insurance are unavailable to the borrower, we expect a non-zero interest to be charged, interest to be compounded, and contingent repayment to take the form of debt roll-over. To the extent that debt build-up eventually leads to bonded labor, we expect debt repayment in labor to be more likely for loans that are long overdue.

Armed with this conceptual framework, we now examine debt repayment practices among rural households. Our objective is to assess whether debt repayment depends on shocks affecting lender and borrower. In particular we examine what form contingent repayment takes: Do unlucky borrowers delay repayment or is the amount repaid reduced as well? Is there evidence of debt roll-over? Under what circumstances do borrowers repay their debt in labor?

3. The Data

A survey was conducted in four villages in the Cordillera mountains of northern Philippines between July, 1994 and March, 1995 (Lund 1996). A random sample of 206 rural households was drawn after taking a census of all households in selected rural districts. These households are dispersed over a wide area; most can only be reached by foot. Three interviews were conducted with each household at three month intervals between July 1994, just after the annual rice harvest, and March 1995, after the new rice crop had been transplanted. The data contain detailed information on debt and shocks.

Data were collected on the characteristics of each household. Respondents were also asked to list all loans taking place within the last three months of each survey round. Great care was taken to collect data on all possible in-kind loan payments, including crops, meals, and labor

services. The characteristics of each transaction were recorded.

Information was also gathered on a variety of income and consumption shocks, such as crop failure, unemployment, sickness, and funerals. Events, such as sickness, that require the organization of traditional religious ceremonies are included as well. In addition, we collected an aggregate subjective measure based on respondents' own assessment of their financial situation. This measure combines many simultaneous shocks and allows respondents to attach their own weight to particular events.[12] Responses range from -2 for very good to +2 for very bad. A similar ranking was obtained for the other party in the loan contract.[13] Data are available on each of 206 households for three survey rounds (see Lund (1996) for details).

Sample households derive most of their income from non-farm activities (Table 1). There are many skilled artisans in this area, and their wood carvings, woven blankets, and rattan baskets supply a growing tourist and export trade. Unearned income – mostly land rentals – is not negligible but very unevenly distributed across households, as is often the case with asset income. Although nearly all households operate their own farm, the majority do not produce enough grain to meet annual consumption needs. Sales of crops and livestock account for a minute fraction of total income.

The vast majority of rural credit transactions are composed of consumption loans between relatives and neighbors. Borrowing from formal credit institutions is rare: only 3.8% of loans in the study are from credit cooperatives, banks, or government organizations.[14] Because these loans are larger, however, they account for 21.1% of new loans in value terms. Formal loans

[12] For example, one respondent whose spouse had been very sick paradoxically ranked herself better during the survey period than during the preceding one. When questioned, the respondent explained that a child got a new job, and that this happy event far outweighed the costs of her husband's sickness.

[13] In 93% of the time, the loan is received from (or given to) a member of the respondent's social network. For each member of the network, we have information on income as stated by the respondent.

[14] The small percentage of formal sector loans in the study is consistent with other studies of rural credit. Udry (1990) and Udry (1994) finds that only 7% of loans in northern Nigeria are from the formal sector. Rosenzweig (1988) reports that 13% of loans in the ICRISAT dataset are from formal institutions. In a study of informal credit in Asia, Ghate (1992) suggests that up to 1/2 of all loans are informal in Thailand, up to 2/3 are informal in Bangladesh, and over 2/3 are from informal sources in the Philippines.

are mostly disbursed for production purposes. Credit from shopkeepers and advances from middlemen account for 28.2% of all new loans and another 11.5% of new loan value. These two categories of loans are likely to have a profit-seeking motive. Together they constitute what, in this paper, we call formal loans. The remainder, which we call informal loans, take place between people who know each other well. In value terms, loans from friends and relatives represent 67.4% of new borrowing (Table 2). Borrowers and lenders are well-acquainted: in nearly all cases, they describe each other as relatives or friends and in more than 85% of the cases, respondents were able to provide a complete accounting of the wealth holdings and demographic characteristics of all their loan partners.

As seen in Table 1, surveyed households are net recipients of gifts and informal loans. We suspect this is due to two main reasons. First, gifts include remittances from relatives living in local towns and distant cities. The study area is thus a net gift recipient. Regarding loans, most formal loans come from the nearby town of Banaue which is not covered by our survey (Table 3). Around 70 percent of informal lending occurs between households in the same village but about a quarter of informal loans also originate from elsewhere in the same district, principally from Banaue. This is probably because Banaue residents are slightly better off than people in nearby villages and therefore can afford to lend money to relatives in need. This explains why the survey area is on aggregate a net borrower.

Participation in informal lending is widespread (Table 4). Only three households in the sample of 206 were not involved in any informal credit transactions over the three survey rounds, while 92% of the households borrowed and 61% lent. Over half of the sample households participated in both borrowing and lending. Informal loans are not exchanged on an anonymous basis within a large community or market but rather through a network of personalized relationships. 92% of households have had credit transactions with their current loan partners in the past,

and the same proportion expect to transact again in the future. Over half the households have reversed roles with their loan partners: current borrowers have given loans to their lender in the past and current lenders have received loans from borrowers. Obtaining credit in the future may thus be a motivation for extending loans today. Furthermore, repeated interaction seems required to build trust between network partners: during the interviews, many respondents stressed the role of trust building before loans can take place. These observations suggest that access to mutual insurance is widespread among studied villages, a feature that in the conceptual section we have associated with egalitarian risk sharing and a decreased likelihood of debt trap.

Loan amounts are shown on Table 5. There is little difference in the average size of loans received or given to friends or relatives, but the coefficient of variation is very large, suggesting large differences within the sample. In all, the survey has recorded 854 different informal loans. Loans from shopkeepers are the next most common category with 329 observations, but these loans are on average smaller in size. In contrast, few loans from formal institutions are recorded in the survey but the magnitude of the amounts lent is much larger – more than 7 times the average size of informal loans. As reflected by the very high coefficient of variation, loans from formal institutions are also extremely varied in size, with a very small number of households receiving the bulk of formal lending.

Most informal loans are taken for consumption rather than investment purposes.[15] Table 6 shows that the most common reason for borrowing is to meet immediate consumption needs. Only 17.2% of informal loans are used for investment purposes, mostly schooling. This raises the possibility that the primary motivation behind informal loans is to smooth consumption. Some gifts are motivated by the desire to repay for a previous loan. In addition, respondents explicitly reported that 5.9% of the loans were taken so that the borrower could give or lend

[15] Loans from banks and credit cooperatives, in contrast, are given for investment purposes only. Kochar (1997) reports similar restrictions on formal lending in India.

the money to someone else. The fact that households act as intermediaries in transferring loans from one friend to another indicates that informal credit is not exchanged through a market system but rather through a network of personal contacts (e.g. Fafchamps and Gubert 2006, de Weerdt 2002). The small proportion of re-lending nevertheless suggests that loan intermediation is not frictionless.

As illustrated in Table 7, informal loans appear quite flexible. None have written contracts, less than 4% specify repayment schedules, and only 0.7% require collateral. The majority of informal loans, nearly 86%, charge no interest. This is a common feature of loans between friends and relatives and is consistent with our egalitarian model of credit cum insurance (e.g. Ben-Porath 1980, Zeller, Schrieder, von Braun and Heidhues 1993). Since inflation is present in the study area, this de facto means that the real rate of interest on most loans is negative. Loans from shopkeepers almost never carry an interest charge.[16] In the conceptual section we have argued that loans that carry a zero or negative real interest cannot lead to debt trap. This finding alone can therefore account for the apparent absence of debt peonage in the study area.

An interest payment is specified in 14.2% of all informal loans which together represent 30% of the value lent. This suggests that an interest is more likely to be charged if the amount borrowed is large. Interest is calculated monthly without compounding. So, a 5% loan of 1000 pesos carries a constant 50 pesos monthly interest charge. Compound interest is not used in the study area probably because people are too illiterate to compute complicated interest charges. We also see that the use of collateral and set repayment date increases with the size of informal loans, but incidence remains very low. This suggests that the threat of legal sanction is negligible except for a few large loans. In contrast, many loans from formal institutions carry an interest

[16] Of course, shopkeepers may build an implicit interest charge in their prices. Unless this implicit interest charge increases with the debt to the shopkeeper – but there is no evidence of this – the zero interest on the debt ensures that the debt does not grow out of control.

and require collateral.

Although 18% of the informal loans repaid during the survey period were not repaid in full, and 6% actually earned a negative return, in only one instance did a lender claim that a default had taken place. In the other cases both lenders and borrowers agreed to forgive part of the loan. By the same token, in 10% of all loans the borrower repaid more than the amount owed.[17] Similar evidence has been reported by Udry (1994) and Platteau and Abraham (1987).[18]

4. Testing contingent repayment

As discussed in Section 2, current theoretical thinking about informal debt contracts revolves around the concept of contingent repayment. The work of Udry (1994) on Northern Nigeria rural lending is usually cited as evidence for it. Udry's work, however, does not distinguish between various forms of contingency, e.g., debt forgiveness, rescheduling, or roll-over. In this section, we test whether contingent repayment occurs and, if so, what form it takes. We examine four dimensions of repayment: timing of payment; amount paid; form of payment; and amount considered as remaining due.

In a standard loan, the amount paid is the amount due according to the contract. We have seen that, in the study area, interest charges are not compounded. According to our best understanding of local contracts and repayment practices, interest is due until the principal has

[17] This occurs either because the loan is repaid ahead of schedule – including interest charges for the full duration of the loan – or because part of the loan is repaid in kind and the value of in kind appears to exceed the amount due. We revisit these issues later in the paper.

[18] Given these features, one may wonder whether such transactions should be called loans or something else entirely, such as quasi-credit as in Platteau and Abraham (1987). What is important for our purpose is that respondents draw a sharp distinction between the two in that the obligation to repay an informal loan is regarded as much stronger than the diffuse obligation to reciprocate a gift. Quasi-credit is formalized in Fafchamps (1999).

been paid in full.[19] The contractual debt obligation D_t at time t is thus given by:

$$\begin{aligned} D_t &= L_0(1+rt) - \sum_{\tau=0}^{t-1} R_\tau \\ &= L_0(1+rt)S_t \end{aligned} \tag{4.1}$$

where L_0 is the loan amount given at time 0, i.e., the principal, r is the monthly interest rate, t is the time elapsed since the loan, R_τ is repayment at time τ, and:

$$S_t \equiv 1 - \frac{\sum_{\tau=0}^{t-1} R_\tau}{L_0(1+rt)}$$

Equation (4.1) shows that D_t can be decomposed into three components: the original loan amount L_0; an interest factor $1+rt$, which is 1 for zero-interest loans; and S_t, the share of the total amount due that remains to be paid according to the contract. If the entire loan is due, $D_t = L_0(1+rt)$.

If surveyed households pay informal loans exactly according to the terms of the contract, equation (4.1) holds exactly and repayment is exactly proportional to D_t without difference across loans according to size and interest rate. We are interested in finding out whether surveyed households on average follow the letter of the contract, or whether actual repayment practices deviate systematically from (4.1). In particular, we want to investigate whether repayment depends on shocks. To this effect, we construct measures of shocks s_t^b (if the respondent is borrower) or s_t^l (if the respondent is lender) as follows.

For each of the three survey rounds we have two types of information on shocks affecting

[19] In our data partial payment is relatively rare and usually small in magnitude – and hence should be regarded as covering elapsed interest charges. In this respect the debt contract closely resembles a rental contract: the interest charge is like a fixed rental payment, due until the good (i.e., the full principal) has been returned to its owner. Given the context of the study, equation (4.1) is a reasonable approximation of contractual terms.

To investigate whether any of our results are driven the assumptions embedded in equation (4.1), we also experimented with alternative formulas, without any significant effect on our results.

respondents. The first type of information is a comprehensive but subjective assessment of respondents' situation: in each of the three rounds, respondents were asked to rank, on a scale from 1 to 5, their current financial situation as better or worse than average. The second type of information is answers to a series of questions about specific shocks, such as disease, loss of employment, and death in the family.

The advantage of the first type of information is that it is comprehensive: it summarizes the entire financial situation of the household, implicitly weighting various shocks by level of severity. Subjective assessment is potentially endogenous, however: respondents who were able to borrow after a shock feel better than those who could not. The second type of information is less susceptible to such bias since it focuses on identifiable events. But it does not provide a summary assessment of the household's financial wherewithal.

In the analysis that follows, we combine the respective strengths of the two sources of information: the comprehensive summary assessment is instrumented with answers to specific shock questions. This generates a single summary measure that is relatively free of respondent bias. To check the robustness of our results, we also investigate the effect of individual shocks on debt repayment.

The instrumenting equation is presented in Appendix A1. Village-time dummies are included as additional instruments to capture aggregate shocks. We see that subjective shock measures are most strongly influenced by sickness and by the need to pay for a funeral or illness ritual. Unemployment does not matter.[20] Village-time dummies are jointly significant, and much of the variation in the dependent variable can be explained by aggregate shocks alone. Identification is achieved by excluding village-time dummies from the timing of repayment regression. We believe this is appropriate given the short time span of the panel and the physical proximity

[20] There is a single harvest season in the survey area, so that households are subject to a single crop shock which happened a few months before the first survey round. The crop shock is not significant and is ignored here.

between the four villages. In this context, village-specific time effects capture local collective shocks due to weather or market conditions. This is to be kept in mind when interpreting the results that follow.

4.1. Timing of repayment

One way of making repayment contingent on shocks is simply to let the borrower repay late. We therefore begin by examining the number of months elapsed between the time at which the loan was granted and the time at which it is repaid. For this analysis, a loan is assumed to be fully repaid if $D_t \leq 0$. The timing of repayment is analyzed via a duration model. The hazard repayment function describes the borrower's conditional propensity to repay. Four sets of regressions are computed. We first distinguish whether the respondent is the lender or borrower. If the respondent is a lender, s_t^l is the shock to the respondent; if the respondent is the borrower, the shock variable is s_t^b. We therefore expect the sign on the shock variable to switch when the respondent is lender.

When the respondent is a borrower, we further distinguish between loans from friends and relatives (informal loans), loans from shopkeepers (shop loans), and loans from financial institutions (formal loans). It is fair to assume that formal loans are primarily granted for commercial reasons. Consequently, we expect formal lenders to display less flexibility and to insist on timely payment. In contrast, we expect contingent repayment to be present in informal loans, as predicted in Section 2.

To prevent the estimations being affected by omitted variable bias, we include additional controls related to the characteristics of the responding household. The vector of household characteristics includes the age of household head, the number of years of schooling completed by the head, a dummy indicating that the male household head has craft or carpentry skills, a

dummy indicating that the head or spouse has a permanent job, the size of the household in adult male equivalents, and the value of household wealth evaluated at the start of the survey. For informal loans and shopkeeper loans, we also have information on the partner to the loan transaction, such as the age of household head and the level of (long-term) income. This latter variable takes the form of a ranking from 1 (poor) to 4 (rich).[21] We do not have information on age and income level for formal loans since, by definition, these are granted by large formal organizations (e.g., banks, cooperatives). Village dummies are included as well to control for unobserved village effects.

Of the loans that were fully repaid by the end of the survey, the overwhelming majority (697 out of 728 or 96%) were paid in a single installment. In those cases, duration analysis is straightforward: it is simply the time elapsed between the moment the loan was given and the moment it was repaid. For the small minority of loans paid in multiple installments, we control for S_t, the share of the loan that has already been repaid. Because loans repaid in multiple installments may be different from other loans, we estimate the model with and without them.

We report in Table 8 the coefficient estimates using only loans paid in a single installment. Results are basically identical if we include all loans and add S_t as an additional regressor. Robust standard errors are reported and corrected for household-level clustering and a Weibull hazard function is used. By analogy with instrumentation methods used with other maximum likelihood estimators, we include the actual shock variable together with the residuals from the instrumenting equation.[22]

Regarding the effect of shocks, results by and large conform with expectations when the respondent is the borrower: shocks affecting borrowers s_t^b delay repayment except that, for

[21] We estimated more parsimonious regressions without control variables in the vector of regressors and got very similar results.

[22] This approach yields an endogeneity test as by-product. We see that when the shock variable is significant, it also tests endogenous.

formal loans, the effect is not significant at the 10% level. In contrast, shocks affecting informal lenders s_t^l do not appear to speed up repayment, contrary to what Udry (1994) found in Northern Nigeria.[23] We find that large loans and interest bearing loans tend to be paid more slowly. This is true for all categories of loans, although the effect is not always significant. When we include all loans in the regression, we find that informal borrowers who have made a partial installment tend to delay further installments. This suggests that partial payment may be a way of demonstrating goodwill in the case of delayed repayment. Other results of interest show that certain categories of borrowers (older, better educated and wealthier) tend to repay faster.

The fact that loans bearing interest are repaid more slowly is a priori puzzling: if delaying increases the interest charge, it would be in the borrower's interest to speed up repayment. As we shall see below, interest charges often are renegotiated *ex post* so that delaying need not carry much penalty. By itself, this does not, however, explain why small, non-interest bearing loans are paid faster. One possible explanation, suggested by a referee, is that, in an insurance perspective, borrowers should keep as many channels of consumption credit as possible, a point that was already made in the conceptual section. As we will see in Section 4.5, lenders tend to refrain from lending again to borrowers who are in arrears. If borrowers anticipate this, it makes sense for them to first clear as many debts as possible to keep open as many cheap lines of credit as possible. The best way to achieve this is to pay small, non-interest bearing debts first.

To check the robustness of our results, we reestimated the model using first repayment only, in case the hazard function driving repayment is different for subsequent installments. Since the overwhelming majority of loans is paid in one installment, the results are very similar and are

[23] Given the nature of the estimation, the standard overidentification test is not feasible. The reader may nevertheless worry that round dummies do not satisfy the exclusion restriction. To test this possibility informally, we reestimate the regressions with instrumented shocks AND round dummies. Intuitively, if round dummies only affect repayment through their effect on shocks, they should not be significant in the repayment regression once we control for shocks. This is indeed what we find.

not reported here to save space. We also reestimated the model using a semi-parametric Cox model. Unlike the Weibull model, the Cox model does not impose a parametric functional form on the hazard. The magnitude of estimated coefficients is broadly similar across the Weibull and Cox models, but certain variables – such as shock variables – are not significant in the Cox model, probably because there is not enough information in the data to estimate coefficients precisely without making a parametric assumption on the hazard rate.

Next we investigate whether similar results are obtained if we use detailed information about specific shocks. To this effect, we reestimate the regressions presented in Table 8 using a reduced-form approach. To this effect, we replace the shock variable with round dummies and one specific shock at a time.[24] Results, which are not reported here to save space, indicate that round dummies are significant in most regressions but specific shocks are not. This suggests that the timing of repayment depends on aggregate shocks but not on idiosyncratic shocks. Although we cannot test this directly, this finding is consistent with the idea that aggregate shocks are more easily observable.

We also worry that the results presented in Table 8 may be affected by unobservable individual effects. This is particularly true for amount due and interest rate: if unreliable borrowers are those that accumulate large, interest-bearing debt, the negative effect of loan size and interest charges could be due to an omitted individual effect. To investigate this possibility, we estimate two alternative models: a shared frailty model, and a 'fixed effect' model. The shared frailty model is roughly equivalent to an individual random effect model. We assume a Gamma distribution for frailty. The fixed effect model is estimated by adding individual fixed effects to the Weibull duration model.[25]

[24] Since shocks are a priori independent, estimation with one category of shock at at time is unproblematic. When we include all shock measures at the same time, spurious results sometimes arise. We believe this is due to the fact that both the dependent variable and the shocks have limited variation. It is well known that, in finite samples, spurious correlation patterns can arise in variables that vary little, even if sample size is reasonably large.

[25] The fixed effect model cannot be estimated for formal credit because of the insufficient number of observations

Results are summarized in Table 9. Controlling for individual unobservables basically does not affect our earlier results, although some coefficients lose in significance when we include individual fixed effects. Coefficients on loan size and interest charge effects are least sensitive to the inclusion of fixed effects: given a choice, borrowers first repay small, non interest-bearing loans. Our earlier finding that borrowers choose to repay zero interest loans faster is therefore confirmed. As we shall see later in the paper, additional interest charges do not appear to be added when a loan is paid late. The rationale therefore seems to be that, since the lender is charging interest, he has already been 'compensated' in some sense and the borrower is entitled to delay repayment. We revisit this issue later.

4.2. Amount paid

Next we turn to the amount paid conditional on repaying. The estimator is a maximum likelihood selection model. The regressors are the same as in the duration model. The time elapsed since the loan was given serves as identifying restriction for the selection equation. Time elapsed raises the probability of repaying – the debt has been due for a longer time. But after we control for the variables entering equation (4.1), it should have no effect on the amount repaid conditional on repaying. This is indeed what we find: time elapsed is significant in the selection equation, but it is non significant when added to the amount paid equation.

Results are presented in Table 10. The selection equation simply confirms earlier results: the propensity to repay a loan decreases with loan amount and interest rate. In contrast, the amount paid equation contains some surprises. First, we find that shocks to the borrower never have a significant effect on the amount repaid, conditional on repaying. In two of the four regressions, the regressor even has the wrong sign. What these results suggest is that, contrary to what

with multiple formal loans.

Udry (1994) finds in Nigeria, reducing the amount repaid when the borrower faces a shock is not the manner by which loan repayment is made contingent on shocks. As shown in Tables 8 and 9, borrowers pay late instead.

Second, we find that the amount paid is roughly proportional to the principal L_t and the share due S_t, as could be expected. But, as indicated by χ^2 tests reported at the bottom of Table 10, the coefficient on L_t is significantly smaller than 1 in three of the four regressions, indicating that loan repayment does not increase proportionally with principal. We also find that, in the informal loan regression, the coefficient on the interest factor is significantly smaller than 1, suggesting that interest charges are not paid in full. This again suggests that debt repayment does not follow contractual interest charges.

To investigate the robustness of our results to the shock measure used, we reestimate each regression presented in Table 10, replacing the shock variable with round dummies and one specific shock at a time.[26] Results, which are not reported here to save space, indicate that round dummies have a significant effect on amount repaid in the regressions for informal loan (respondent borrower) and loan from shopkeeper. But in the informal loan equation this effect is opposite to the sign of the round dummy in the shock regression (Table A1). Idiosyncratic shocks are rarely significant. The sickness variable is significant with the anticipated sign in the informal loan regression. The sickness and acute sickness regressions are significant in the formal loan equation but with the opposite sign, suggesting that sick people repay more. These results by and large confirm our earlier conclusion: we find no strong evidence that a shock to the borrower leads to a reduction in the amount repaid, conditional on repaying.

[26] The loan from shopkeeper regression marginally fails to satisfy an overidentification test based on a linear regression equivalent of Table 10. To our knowledge, there does not exist an overidentification test for maximum likelihood selection models.

4.3. Form of repayment

Next we turn to the form of repayment. In the area studied, repayment takes essentially two forms: cash and labor. Some 17% of all loan repayments take the form of labor. In all these cases, respondents were asked to impute a value to their labor. Such imputation is reasonable in this context since one would expect borrowers to agree with the lender by how much the debt is reduced when they work for them.

We estimate a logit model of whether repayment takes the form of labor or not, conditional on repaying.[27] Regressors are the same as before. Time elapsed since the loan was granted is also included to check whether payment in labor is more likely for old unpaid loans, a finding that would support the labor bonding story.

Results are presented in Table 11. The estimator is logit.[28] Only observations with a repayment are used for estimation. The regression therefore captures the probability of repayment in labor, conditional on repayment taking place.

For informal loans, shocks are not significant. In contrast, for loans from shopkeepers a shock to the borrower has a positive sign and is marginally significant. This means that, conditional on repaying, a borrower experiencing a bad shock is more likely to repay in labor. The evidence therefore suggests that payment in labor is substituted for cash payment by borrowers in difficulty. This result is at prima facie consistent with the labor bonding model which predicts that a debtor in difficulty would eventually be forced to work for the lender.[29]

We also find that payment in labor is more likely for large shop loans. Again, this is consistent

[27] In all cases except two, repayment within a given survey round is either in cash or in labor, not both.

[28] We also estimated a multinomial logit model with three choices: (1) not paying; (2) repaying in labor; and (3) repaying in cash. Identical conclusions obtain. We also estimated a fixed-effect logit model, but the number of observations is too small for inference purposes (i.e., none of the regressors is significant).

[29] As for Tables 8 and 19, we repeated the analysis with round dummies and idiosyncratic shocks replacing the comprehensive shock variable. The results, not shown here to save space, show that the positive shock result for loans from shopkeepers is driven by an aggregate shock. In contrast, round dummies are not significant for informal loans. The analysis also shows that, for informal loans, sickness of the borrower increases the likelihood of repayment in labor – possibly by a dependent in the borrower's household.

with labor bonding, i.e., highly indebted individuals providing labor payments. However, we do not find that labor payment increases over time, as would be suggested by the labor bonding model. A different picture emerges for informal loans. In this case, payment in labor is less likely for large loans. Payment in labor thus appears to be a friendly way of reciprocating for small financial assistance. When the amount is larger, repayment in cash is expected. Also, payment in labor is less likely for old loans. What this suggests is that borrowers unable to pay on time volunteer their labor, possibly to demonstrate good faith. This explains why payment in labor takes place early on, not later as would be the case for labor bonding.

Other results of interest in the informal loan regressions show that the wealth of borrower and lender affect the probability of repayment in labor in opposite direction. Conditional on repayment taking place, repayment in labor is less likely for rich borrowers, while rich lenders are more likely to be repaid in labor. These results are not inconsistent with the labor bonding model.

Taken together, the evidence therefore suggests that labor bonding is not a feature of informal lending. We cannot, however, entirely rule out the possibility of some mild form of labor bonding for loans from shopkeepers. We say mild because time elapsed since the loan was granted is not significant. This finding is in close agreement with the description of labor bonding and debt peonage made by Geertz (1963) in neighboring Indonesia: it is a feature of the emerging market economy, not of 'traditional' rural society.

4.4. Debt forgiveness

So far we have examined actual debt repayment. There remains the possibility that borrowers who face a bad shock are simply dispensed from repaying a loan or from repaying it in full. To examine this possibility, we make use of information collected at the end of the survey in round

3. Respondents were asked the amount they regard as remaining due on each individual loan. We denote this amount Ω. For 42% of the loans, $\Omega = 0$. Other loans have remaining balances. The debt forgiveness ratio ϕ can then be computed as:

$$\phi = \frac{D_3 - \Omega}{L}$$

where L is the loan principal and D_3 is the amount due in round 3 as given by formula (4.1), i.e., the 'contractual debt'.

In 3.7% of the cases, ϕ is negative: the borrower paid more than was stipulated in the contract. In 72.2% of the loans, $D_3 = \Omega$ so that the contractual debt matches exactly the amount considered due by respondents at the end of round 3. In the remaining 24.1% of cases, the contractual debt is higher than what the respondent reports as remaining due. In most cases the difference is a small proportion of the principal. But for 7% of the loans, the difference exceeds 50% of the principal.

The reader may worry that the discrepancy between contractual debt D_3 and amount due Ω may be driven by error of measurement, for instance due to a wrong imputation of repayment in labor. To investigate this possibility, we look whether the distribution of ϕ differs between loans repaid (in full or in part) in labor, and loans repaid exclusively in cash. No significant difference emerges: the average values of ϕ for loans repaid (at least in part) in labor and loans repaid exclusively in cash are 0.07 and 0.11, respectively, a difference that is not statistically significant. From this we conclude that high values of ϕ are not due to wrong imputation of labor.

We investigate whether ϕ responds to shocks by regressing it on shocks and the three components of D_3. Regression results are presented in Table 12. Shock variables are not significant in any of the regressions. Except in the formal loan regression, the interest factor $1 + rt$ dominates

the results: the higher the interest factor, the higher debt forgiveness is. In all regressions, the time elapsed since the loan was granted is significant as well, suggesting that, as time passes, unpaid loans come to be regarded as 'forgiven' in the eyes of respondents.

To ensure that these results are not driven by misunderstandings regarding contract terms, we repeat the analysis using only the 42% of all loans that are considered fully repaid. Virtually identical results obtain. We also verify that our findings are not an artifact of an erroneous imputation of partial payments in equation (4.1). To this effect we assume instead that any partial payment is deducted from the principal and that interests accrue only on the remaining debt. We again obtain very similar findings. This is hardly surprising given that partial payment only occurs in less than 5% of the loans. Detailed regression results are omitted for lack of space.

What the evidence therefore suggests is that for informal loans debt forgiveness is limited to waiving part of the interest charges – what we have called debt rescheduling in the conceptual section. This is further confirmed by conducting a simple t-test on ϕ between zero-interest loans and interest-bearing loans. The average ϕ is 0.04 and 0.29 without and with interest, respectively. The difference is strongly significant, with a t-statistic of 13.8 and a p-value of 0.0000. Put differently, while borrowers pay zero-interest loan with only very minor debt forgiveness on average, in most cases they fail to pay all contractual interest. If we limit our analysis to zero-interest loans only, only one variable is significant across all regressions: the time elapsed since the loan was granted, meaning that old loans which have not been paid tend to be considered forgiven by the respondent.

These findings are inconsistent with the debt trap model presented in Section 2: if lenders were using accumulated interest to push borrowers into a debt trap, they would add unpaid interest to the principal instead of systematically reducing interest charges ex post. We thus find no evidence of debt roll-over.

4.5. Future lending

Before concluding, we examine the data for evidence of over-accumulation of debt. If (nominal) debt were used to gain economic power over borrowers, we would expect heavily indebted individuals to be forced to borrow ever more, hence falling into a debt trap. In contrast, if debt peonage is not part of lenders' strategy, we expect them to refrain from lending to individuals who already owe them a lot of money. By the same token, they should be reluctant to lend to individuals who have taken a long time to pay previous debt and who have already been charged high interest rates in the past.

For each loan received, respondents were asked at the end of round 3 whether the lender would be willing to lend them more. For 375 loans, we were able to match answers given by the borrower and lender recorded in the survey.[30] In 225 cases (60%) lender and borrower agree more lending is possible; in 94 cases (25%), lender and borrower agree there will be no further lending. Lender and borrower disagree in only 56 cases (15%). These results suggest that responses given to the question are reasonably accurate. Overall, some 61% of borrowers say they would be able to borrow more from the same lender if they wanted to. Similarly, for each loan given respondents were asked whether they would be willing to lend more to the borrower. 63% said they would agree to lend more to the same borrower if they were asked to.

To investigate whether loans tend to snowball, we regress respondents' expectations of future lending on the amount they still owe, the contractual interest rate in their current loan, and the time elapsed since the current loan was granted. Results are presented in Table 13. Contrary to the debt trap model, we find that the amount still due, the interest rate on the current loan, and the time elapsed since the loan was granted all have a negative effect on the expectation of future lending. Except for on coefficient in the shopkeeper regression, this is true across all loan

[30] These are cases in which both lender and borrower are respondents in the survey.

categories and whether the respondent is the lender or the borrower, but coefficients are not all significant. Put differently, this means that borrowers who owe a lot, are paying interest on their current debt, and are behind in their repayment are less likely to receive a new loan. These findings constitute further evidence that forcing borrowers into high debt is not the strategy pursued by lenders in our sample.

5. Conclusion

In this paper, we have examined the loan repayment practices of rural Filipino households. Our results complement the existing literature in several ways. Udry (1994), for instance, demonstrates that the repayment of informal loans is contingent upon shocks affecting lender and borrower. But he does not show which aspect of repayment is contingent, as we do here. In a survey of manufacturing firms reported by Fafchamps, Pender and Robinson (1995), firms were asked how they deal with liquidity crises. One of the most often cited response was to delay payment to suppliers. The authors further document the fact that interest charges for late payment by Zimbabwean manufacturers are nearly never paid, even when they are stipulated in the sales contract. These findings make sense when compared with the results reported here.

The literature on rural lending has often worried about debt trap and labor bonding, although there is little hard evidence that it is a widespread phenomenon.[31] Poor people facing bad shocks are seen as easy prey for moneylenders because they can easily be forced to accept a very disadvantageous loan contract. These practices are typically associated with usurious interest rates, repayment in labor, debt roll-over, and ex post renegotiation of payment terms.

[31] Concerns about debt traps have often been voiced with respect to South Asia in general and India in particular. Bales (2000), for instance, presents evidence relative to brick-makers held in heritable debt-bondage in Pakistan and to farmers held in debt-bondage in India. Edmonds and Sharma (2004) discuss debt bonding in Nepal although they do not provide direct empirical evidence of it. Yet neither Bliss and Stern (1982) in their detailed study of the Palanpur village in Uttar Pradesh (India) nor Platteau, Murickan and Delbar (1985) in their investigation of three fishing villages in Kerala (India) find any evidence of debt peonage and labor bonding. How common these phenomena are thus remains an empirically unsettled issue.

We already know that households in our study area borrow to deal with shocks (Fafchamps and Lund 2003). Furthermore, some of the practices associated with debt peonage, such as repayment of debt in labor, are present in our data. We may thus worry that debt traps are a reality in the study area. The anthropological evidence, however, suggests that few households in the Ifugao region fall victim of debt traps and that the distribution of assets has remained remarkably egalitarian compared to surrounding areas (e.g. Barton 1969, Conklin 1980). One objective of this paper was therefore to identify which features of the credit market preclude a high incidence of debt peonage in such a fertile institutional environment.

We find little or no support for debt peonage in our study area. The only piece of evidence consistent with the existence of labor bonding concerns the repayment of shop credit in labor, but shop loans seldom carry interest and we find no evidence of debt roll-over and increased indebtedness over time. Our results suggest that the major avenue by which the risk of debt trap is minimized in the study area is that interest is nearly never charged and, when interest charges are stipulated in the contract, they are seldom paid in full. In this context, it is hardly surprising that lenders refrain from granting new loans to borrowers who have not yet repaid old loans or taken a long time to repay them. Taken together, these findings make it unlikely that surveyed households would fall in a debt trap.[32]

Our results also put Udry's finding in perspective. By unpacking loan repayment into various components – timing, amount paid, form of payment, and debt forgiveness – we were able to clarify the extent to which debt repayment is contingent upon shocks. Contrary to Udry's claim, we do not find that shocks affect the amount repaid or the extent of debt forgiveness. The effect of shocks is primarily through payment delays and repayment in labor: borrowers in difficulty are given more time to pay and allowed to pay part of the loan in labor, usually in the form of

[32] The fact that lenders in the study area do not compound interest is another piece of evidence in the same direction.

an 'advance payment'. The two go together: borrowers work for the lender when they cannot pay, then pay the remainder in cash at a later date. Debt forgiveness is present in the survey area, but it concerns primarily a reduction in interest charges. This is a far cry from general equilibrium models of contingent credit in which all insurance takes place through contingent repayment (e.g. Townsend 1993, Udry 1992).

Debt repayment practices in rural Philippines are not enormously different from what we would observe in other parts of the world: borrowers in difficulty are given more time to repay but are requested to demonstrate their good faith in exchange for leniency. What distinguishes informal credit from formal credit is the widespread use of zero-interest consumption loans. We also find that, when an interest is charged, lenders accept a reduction of interest charges ex post rather than force a debt build-up. These features of informal credit that we have documented for Ifugao may be present elsewhere as well (see for instance Platteau and Abraham (1987)).

The evidence provided here does not explain why lenders display such restraint. One likely explanation for this leniency is that households have access to alternative sources of insurance. Fafchamps and Lund (2003) indeed show that surveyed households partly insure through gifts and loans channelled through their social network. Combining the two sets of findings suggests a way of testing whether access to alternative insurance is the reason why lenders cannot push borrowers into a debt trap. Borrowers with smaller or weaker network would have less access to insurance and therefore should be more easily forced into long-term debt dependency, and thus more likely to actually pay interest charge. An alternative (and perhaps complementary) interpretation of our results is that lenders and borrowers follow redistributive norms of behavior (Platteau 1996). Moral condemnation and other social pressure may prevent lenders from abusing their power, hence forcing them to consent ex post debt reduction. In this case, the size of someone's network would not affect their likelihood of paying interest charges. These

predictions could in principle be tested, given suitable data.

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Table 1. Income, Gifts, and Loans
(over a nine months period)

Sources of Income	**Mean** (pesos)	**Coefficient of variation**
Non-farm earned income	15,178	1.77
Unearned income (1)	1,818	8.80
Value of annual rice harvest	5,596	2.49
of which, crop sales	226	3.45
Net livestock sales	254	11.22
Gifts and Loans		
Gifts received	5,394	1.71
Gifts given	2,569	2.56
Net gifts	2,825	3.72
Net informal borrowing	2,124	2.73
Net gifts and informal borrowing	4,949	2.40
Number of observations	206	

(1) Includes rental income, pensions, and sale of some assets. (2) In terms of number of animals, fowl counts for 68%, pigs for 16%, cattle and goats for 1%, and other animals for 14%. The total average value of livestock is 2,605 Pesos and the corresponding coefficient of variation is 1.85.

Table 2. New Loans
(in Pesos per household over the nine months covered by the three survey rounds)

	Money flowing in	%	out	%
Total, in value	5383	100.0%	1159	100.0%
Breakdown by source or destination, in value				
With close relatives	323	6.0%	78	6.7%
With distant relatives	2293	42.6%	753	65.0%
With friends and neighbors	1013	18.8%	289	25.0%
With shopkeepers	360	6.7%	39	3.4%
With formal institutions (credit coop., banks, etc.)	1133	21.1%	0	0.0%
With others (moneylenders, etc.)	260	4.8%	0	0.0%

Note. A loan partner is a close relative when he is a son/daughter, a son/daughter in law, a grandchild, a parent or a brother/sister. He is a distant relative when he is a nephew/niece or a cousin/aunt/uncle

Table 3. Distribution of Loans by Residence of Loan Partner
(computed on the basis of loans taken or given over the three survey rounds; weighted by loan value)

Relationship of Borrower/Lender	Same barangay	Barangay in Banaue	Other Ifugao	Other CAR	Lowland	Manila	Abroad
Close relatives	55.9%	22.4%	1.2%	8.9%	11.0%	0.6%	0.0%
Distant relatives	74.2%	19.9%	2.1%	0.6%	1.0%	0.0%	2.2%
Friends and neighbors	65.7%	32.2%	2.0%	0.0%	0.0%	0.0%	0.1%
All informal	69.8%	23.9%	2.0%	1.3%	1.7%	0.1%	1.3%
Shopkeepers	30.1%	59.0%	0.1%	5.5%	5.4%	0.0%	0.0%
Formal institutions	46.2%	52.5%	0.0%	0.0%	0.0%	0.0%	1.3%
All formal	38.7%	55.5%	0.1%	2.5%	2.5%	0.0%	0.7%
All	61.6%	32.2%	1.5%	1.6%	1.9%	0.1%	1.2%
Number of observations	1,235						

Note. Banaue is the closest town located less than 30 kilometers from the four sample villages (*barangay*)
Sample villages are located in the Ifugao province, within the Cordillera Administrative Region (CAR)

Table 4. Participation in Informal Credit

Participation during survey	
Borrowed at least once over 3 rounds	92%
Lent during at least once over 3 rounds	61%
Borrowed and lent at least once over 3 rnds	54%
Borrowed and lent in same survey round	24%
Did not participate over the three rounds	1%
Repeated Interaction	
Repeated loans between rounds	92%
Switched roles in lending (*)	52%
Expect to borrow or lend again from at least one lender	92%
Number of observations	206

Source: Survey data. (*) Switched between lending and borrowing during the survey.

Table 5. Loan Amount
(computed on the basis of loans taken or given over the three survey rounds)

Relationship of Borrower/Lender	**Mean** (pesos)	**Coefficient of variation**	**Number of observations**
Close relatives	908	1,192	91
Distant relatives	1,169	2,016	429
Friends and neighbors	722	1,637	334
All informal	967	1,811	854
Shopkeepers	468	888	329
Formal institutions	7,081	7,078	52
All formal	1,370	3,546	381
All	1,091	2,484	1,235

Table 6. Reason for Receiving a Loan
(computed on the basis of loans taken or given over the three survey rounds)

	Reason the loan was (informal loans)		Reason the loan was taken (formal loans)	
	(unweight.)	*(weighted by loan value)*	*(unweight.)*	*(weighted by loan value)*
Consumption	**72.9%**	**53.8%**	**84.3%**	**35.0%**
To pay for household consumption	41.3%	19.3%	76.9%	21.9%
To pay for medical expenditures	20.8%	13.8%	5.0%	10.7%
To pay for funeral and other ritual expenditures	10.8%	20.7%	2.4%	2.5%
Investment	**17.2%**	**31.7%**	**9.4%**	**41.1%**
To pay for school expenditures	10.8%	9.1%	2.4%	8.4%
To finance a business or farm investment	4.9%	11.5%	6.8%	30.8%
To apply for a job abroad	1.5%	11.1%	0.3%	1.9%
Reciprocity	**9.6%**	**14.5%**	**6.3%**	**23.8%**
To repay another loan or gift	3.8%	6.9%	4.7%	23.1%
To give another gift or loan	5.9%	7.6%	1.6%	0.7%
Other reasons	0.2%	0.0%	0.0%	0.0%
Number of observations	**854**		**381**	

Table 7. Loan Characteristics, by Source
(computed on the basis of loans taken or given over the three survey rounds)

	Interest-Bearing Loans		**Collateral used**		**Agreed-upon repayment date**	
Relationship of Borrower/Lender	*(unweigh.)*	*(weighted by loan value)*	*(unweigh.)*	*(weighted by loan value)*	*(unweigh.)*	*(weighted by loan value)*
Close relatives	1.1%	0.2%	0.0%	0.0%	3.3%	1.3%
Distant relatives	17.7%	31.7%	0.9%	2.7%	2.3%	1.4%
Friends and neighbors	14.1%	36.7%	0.6%	1.4%	5.7%	5.5%
All informal	14.2%	30.0%	0.7%	2.0%	3.8%	2.6%
Shopkeepers	0.6%	1.0%	0.9%	5.5%	4.6%	7.9%
Formal institutions	48.1%	53.0%	36.5%	62.5%	30.8%	32.7%
All formal	7.1%	37.7%	5.8%	45.7%	8.1%	25.4%
All	12.2%	33.0%	2.3%	18.9%	5.1%	11.4%
Number of observations	1,235		1,235		1,235	

Table 8. Propensity to repay
(estimator is duration model)

	Respondent is borrower						Respondent is lender	
	Informal loans		Loans from shopkeepers		Formal loans		Informal loans	
Loan characteristics	**Hazard**	**z-stat.**	**Hazard**	**z-stat.**	**Hazard**	**z-stat.**	**Hazard**	**z-stat.**
Loan amount (in log)	0.727	**-6.80**	0.872	**-2.03**	0.927	-0.44	0.876	**-1.95**
Interest factor (in log)	0.104	**-7.94**	0.364	**-2.12**	0.007	**-3.98**	0.088	**-2.64**
Shock to respondent	0.821	**-1.82**	0.705	**-2.26**	0.711	-0.92	0.923	-0.50
Residual from instr. eq.	1.293	**2.00**	1.443	**1.76**	1.641	1.08	0.890	-0.66
Household characteristics of respondent:								
Age of household head	1.013	**2.26**	1.024	**3.17**	1.036	1.44	0.996	-0.42
Last grade completed by head	1.030	1.54	0.988	-0.46	1.057	1.05	0.983	-0.62
Craft skill dummy	1.101	0.79	1.308	1.46	1.440	0.82	0.914	-0.45
Permanent wage dummy	1.122	0.82	1.609	**2.09**	0.777	-0.38	0.961	-0.14
Household size	0.956	-1.39	0.921	-1.58	1.065	0.35	0.986	-0.21
Wealth	1.053	**3.15**	1.031	0.97	0.986	-0.23	0.998	-0.07
Household characteristics of partner:								
Age of household head	1.013	**3.34**	0.994	-0.73			1.002	0.33
Income level	1.045	0.50	0.934	-0.50			1.421	**1.96**
Village dummies:								
Village 2	0.840	-1.13	0.764	-1.22	1.063	0.09	0.931	-0.22
Village 3	0.748	**-1.77**	0.926	-0.30	2.409	1.63	0.930	-0.21
Village 4	0.876	-0.88	0.729	-1.12	9.034	**1.81**	1.098	0.29
p-parameter	0.510	**14.14**	0.592	**12.39**	0.598	**4.03**	0.295	**5.65**
Nb. of subjects	1158		467		87		427	
Nb. of failures	429		204		31		162	
Time at risk	3003		1117		242		1152	

Dependent variable is time between the time the loan was granted and a repayment was made.
Standard errors are adjusted for clustering

Table 9. Propensity to repay controlling for household heterogeneity

	Respondent is borrower				Respondent is lender	
	Informal loans		Loans from shopkeepers		Informal loans	
A. Shared frailty model	**Hazard**	**z-stat.**	**Hazard**	**z-stat.**	**Hazard**	**z-stat.**
Loan amount (in log)	0.703	**-7.70**	0.845	**-2.02**	0.808	**-2.53**
Interest factor (in log)	0.064	**-7.58**	0.085	-1.63	0.062	**-2.61**
Shock to respondent	0.777	**-2.18**	0.614	**-2.69**	1.001	0.00
Residual from instr.eq.	1.384	**2.31**	1.775	**2.41**	0.923	-0.34
Household characteristics of respondent:						
Age of household head	1.015	**2.08**	1.031	**2.34**	0.996	-0.30
Last grade completed by head	1.044	**1.98**	0.997	-0.07	0.985	-0.40
Craft skill dummy	1.063	0.39	1.111	0.36	0.823	-0.60
Permanent wage dummy	1.024	0.12	1.148	0.35	0.927	-0.21
Household size	0.973	-0.65	0.915	-1.06	1.064	0.66
Wealth	1.042	**1.65**	1.062	1.22	1.044	1.22
Household characteristics of partner:						
Age of household head	1.012	**2.75**	1.006	0.62	1.013	1.40
Income level	1.106	1.10	0.902	-0.56	1.477	**1.69**
Village dummies:						
Village 2	0.804	-1.16	1.000	0.00	0.836	-0.41
Village 3	0.657	**-2.18**	1.002	0.00	0.689	-0.84
Village 4	0.730	-1.54	0.932	-0.16	0.920	-0.19
p-parameter	0.627	**14.40**	0.914	**12.46**	0.636	**7.95**
theta-parameter (frailty distrib.)	-1.404	**-4.77**	-0.298	-1.14	-0.147	-0.55
B. Household fixed effect model						
Loan amount (in log)	0.662	**-6.12**	0.973	-0.23	0.760	**-1.98**
Interest factor (in log)	0.029	**-8.30**	0.015	**-2.31**	0.050	**-2.31**
Shock to respondent	0.736	**-2.30**	0.591	**-2.20**	0.947	-0.24
Residual from instr.eq.	1.558	**2.64**	2.212	**2.44**	1.125	0.41
Household characteristics of partner:						
Age of household head	1.008	1.42	1.026	1.44	1.027	**2.26**
Income level	1.168	1.28	0.740	-1.01	1.145	0.38
p-parameter	0.889	**21.91**	1.400	**23.20**	1.033	**14.71**
Nb. of subjects	1158		467		427	
Nb. of failures	429		204		162	
Time at risk	3003		1117		1152	

The estimator is a duration model with Weibull distribution. Only loans with a single payment are used.
The dependent variable is the time elapsed between the granting of the loan and repayment.
Share-frailty and fixed-effect models did not converge using formal loans only.

Table 10. Amount repaid

	Respondent is borrower						Respondent is lender	
	Informal loans		Loans from shopkeepers		Formal loans		Informal loans	
A. Amount repaid	**Coef.**	**z-stat.**	**Coef.**	**z-stat.**	**Coef.**	**z-stat.**	**Coef.**	**z-stat.**
Loan amount (in log)	0.918	**51.35**	0.954	**49.14**	0.629	**5.17**	0.964	**33.38**
Interest factor (in log)	0.383	**1.84**	1.131	**7.59**	0.728	0.37	0.891	**2.13**
Shock to respondent	0.054	1.42	-0.039	-0.84	0.135	0.34	-0.014	-0.19
Residual from instr.eq.	-0.043	-0.96	0.050	0.72	0.318	0.64	0.105	1.11
Household characteristics of respondent:								
Age of household head	-0.002	-0.88	0.001	0.53	0.022	1.40	-0.003	-0.52
Last grade completed by head	0.000	0.01	0.012	1.44	-0.045	-0.90	0.000	0.02
Craft skill dummy	0.002	0.04	-0.035	-0.57	-0.789	**-1.73**	-0.073	-0.69
Permanent wage dummy	-0.131	**-2.47**	-0.014	-0.15	0.022	0.06	-0.084	-0.65
Household size	0.008	0.74	0.014	0.73	-0.079	-0.50	0.009	0.29
Wealth	0.015	**2.43**	0.006	0.72	0.096	1.29	0.018	1.46
Household characteristics of partner:								
Age of household head	0.001	0.79	0.001	0.59			0.004	1.26
Income level	-0.034	-1.11	-0.081	**-1.87**			-0.103	-1.62
Village dummies:								
Village 2	-0.041	-0.76	0.036	0.56	0.568	0.93	-0.097	-0.82
Village 3	-0.047	-1.05	-0.071	-0.72	-0.616	**-1.78**	0.148	1.08
Village 4	0.025	0.53	0.013	0.19	0.162	0.10	-0.122	-0.99
Intercept	0.444	**2.82**	-0.071	-0.38	1.873	1.23	0.813	**1.79**
B. Selection equation								
Loan amount (in log)	-0.223	**-6.43**	-0.060	-1.06	-0.081	-0.59	-0.028	-0.55
Interest factor (in log)	-1.911	**-5.84**	-1.446	**-2.96**	-4.946	**-2.98**	-1.489	**-2.77**
Time elapsed since loan	0.171	**6.40**	0.214	**6.44**	0.235	**2.61**	0.045	**1.97**
Shock to respondent	-0.116	-1.21	-0.060	-0.43	-0.615	**-1.90**	0.061	0.49
Residual from instr.eq.	0.158	1.37	0.078	0.40	0.587	1.46	-0.124	-0.80
Household characteristics of respondent:								
Age of household head	0.007	1.62	0.018	**2.63**	0.028	1.51	0.002	0.24
Last grade completed by head	0.025	1.57	-0.001	-0.03	0.050	1.08	0.007	0.30
Craft skill dummy	0.022	0.22	0.121	0.70	0.402	1.04	0.005	0.03
Permanent wage dummy	0.059	0.57	0.316	1.55	0.056	0.14	-0.049	-0.20
Household size	-0.026	-0.86	-0.052	-1.07	0.005	0.03	0.006	0.11
Wealth	0.037	**2.43**	0.010	0.37	0.002	0.04	-0.010	-0.44
Household characteristics of partner:								
Age of household head	0.008	**2.46**	-0.003	-0.54			-0.005	-1.06
Income level	0.077	1.08	-0.052	-0.49			0.232	**1.96**
Village dummies:								
Village 2	-0.190	-1.50	-0.159	-0.77	0.043	0.08	0.062	0.24
Village 3	-0.273	**-1.82**	0.057	0.25	0.725	**1.96**	-0.048	-0.20
Village 4	-0.108	-0.88	-0.226	-0.87	2.115	**2.02**	0.068	0.30
Intercept	-0.377	-0.98	-0.970	**-1.70**	-2.628	-1.45	-0.772	-1.25
arctan(rho)	0.080	0.66	0.501	**2.83**	-0.204	-0.22	-1.936	**-8.27**
ln(sigma)	-0.937	**-12.49**	-0.978	**-8.26**	-0.345	**-2.44**	-0.563	**-3.17**
Number of observations	1170		472		87		438	
of which: uncensored	437		208		32		166	

Testing proportionality to amount due

	chi-square	p-value	chi-square	p-value	chi-square	p-value	chi-square	p-value
Coefficient of loan amount=1	**21.13**	0.0000	**5.63**	0.0177	**9.31**	0.0023	1.51	0.2189
Coefficient of interest factor=1	**8.82**	0.0030	0.77	0.3799	0.02	0.8890	0.07	0.7932
Two coefficients are equal	**6.10**	0.0135	1.26	0.2615	0.00	0.9597	0.03	0.8610

Test of overidentifying restrictions

Hansen J stat	p-value	Hansen J stat	p-value	Hansen J stat	p-value	Hansen J stat	p-value
17.43	0.1341	**20.55**	0.0574	13.03	0.2221	6.33	0.8985

The estimator is a maximum likelihood selection model. The dependent variable is the amount repaid in round t.
Standard errors are adjusted for clustering.

Table 11. Repayment in labor

	Respondent is borrower				Respondent is lender	
	Informal loans		Loans from shopkeepers		Informal loans	
	Coef.	**z-stat.**	**Coef.**	**z-stat.**	**Coef.**	**z-stat.**
Loan amount (in log)	-0.195	**-1.83**	1.580	**3.86**	-0.292	-1.37
Interest factor (in log)	-2.938	-1.30	-0.084	-0.70	-2.476	-0.62
Time elapsed since loan	-0.194	**-2.16**	(*)		-0.060	-0.42
Shock to respondent	0.209	0.65	1.130	**2.31**	-0.660	-1.05
Residual from instr.eq.	-0.137	-0.35	-1.224	**-2.04**	0.188	0.26
Household characteristics of respondent:						
Age of household head	0.028	**1.78**	-0.013	-0.52	-0.041	-1.21
Last grade completed by head	-0.091	-1.65	-0.125	**-1.70**	0.080	1.02
Craft skill dummy	0.332	0.70	1.290	**1.88**	-1.266	**-1.73**
Permanent wage dummy	-1.031	**-1.89**	1.203	**1.86**	-0.351	-0.31
Household size	0.124	1.39	-0.504	**-1.94**	-0.270	-1.42
Wealth	-0.286	**-2.03**	-0.301	**-1.83**	0.213	**3.28**
Household characteristics of partner:						
Age of household head	0.005	0.43	0.008	0.31	0.012	0.48
Income level	0.512	**1.99**	-0.509	-1.09	-2.493	**-3.33**
Village dummies						
Village 2	-0.778	**-1.75**	-2.463	**-2.29**	0.303	0.30
Village 3	-0.302	-0.68	-1.551	-1.37	0.758	1.02
Village 4	-0.597	-1.03	-0.476	-0.33	-2.405	**-2.52**
Intercept	-1.621	-1.25	-5.278	**-2.23**	7.281	**2.27**
Number of observations	437		208		166	
Pseudo R-squared	0.195		0.397		0.313	

The estimator is logit. Only observations with repayment are included.
The dependent variable takes value one if repayment is in labor
Since formal loans are never repaid in labor, they are not included.
Standard errors are adjusted for clustering
(*) variable dropped from the regression because it perfectly predicts the outcome.

Table 12. Debt forgiveness

	Respondent is borrower						Respondent is lender	
	Informal loans		Loans from shopkeepers		Formal loans		Informal loans	
	Coef.	**t-stat.**	**Coef.**	**t-stat.**	**Coef.**	**t-stat.**	**Coef.**	**t-stat.**
Loan amount (in log)	0.002	0.23	0.002	0.26	0.024	0.77	0.006	0.50
Interest factor (in log)	0.518	**6.57**	0.401	**4.11**	-0.096	-0.38	0.524	**1.71**
Time elapsed since loan	0.012	**2.66**	0.022	**3.64**	0.031	1.60	0.011	**1.73**
Shock to respondent	0.016	0.32	-0.039	-0.68	0.097	0.62	-0.042	-0.53
Residual from instr. eq.	-0.052	-1.00	0.047	0.65	-0.088	-0.51	0.054	0.67
Household characteristics of respondent:								
Age of household head	0.002	1.44	0.001	0.74	0.008	1.65	-0.004	-1.56
Last grade completed by head	0.002	0.60	-0.008	**-1.66**	0.000	0.03	0.001	0.26
Craft skill dummy	-0.040	**-1.68**	0.070	1.61	-0.061	-0.77	-0.008	-0.18
Permanent wage dummy	0.067	**1.93**	0.069	1.37	0.056	0.52	-0.103	**-2.12**
Household size	-0.002	-0.28	-0.010	-1.04	-0.044	-1.94	0.000	0.02
Wealth	-0.006	-1.54	0.001	0.12	0.000	0.08	-0.002	-0.45
Household characteristics of partner:								
Age of household head	0.000	-0.49	-0.001	-1.03			-0.002	-1.00
Income level	0.002	0.09	0.024	0.79			0.052	0.80
Village dummies:								
Village 2	-0.069	**-2.04**	-0.050	-1.28	0.070	0.67	-0.046	-0.51
Village 3	-0.023	-0.63	0.046	0.77	-0.045	-0.40	0.017	0.32
Village 4	-0.042	-1.23	-0.074	**-1.69**			-0.049	-0.70
Intercept	-0.047	-0.47	-0.096	-0.85	-0.406	-1.20	0.097	0.75
Number of observations	463		143		43		149	
R-squared	0.372		0.238		0.345		0.323	
Test of overidentifying restrictions								
	Hansen J stat	**p-value**	**Hansen J stat**	**p-value**	**Hansen J stat**	**p-value**	**Hansen J stat**	**p-value**
	7.736	0.1017	0.907	0.8237	**9.178**	0.057	2.788	0.5939

The estimator is OLS. The dependent variable is the debt forgiveness ratio (see text for details).

Table 13. Expectation of future lending

	Respondent is borrower						Respondent is lender	
	Informal loans		Loans from shopkeepers		Formal loans		Informal loans	
	Coef.	z-stat.	Coef.	z-stat.	Coef.	z-stat.	Coef.	z-stat.
Loan amount still due (in log)	-0.096	**-2.41**	-0.011	-0.12	-0.868	-1.31	-0.108	-1.39
Interest rate on current loan	-6.965	**-2.57**	5.637	0.69	-50.678	-1.62	-12.927	**-1.73**
Time elapsed since loan	-0.173	**-3.95**	-0.076	-0.77	-0.648	**-1.91**	-0.206	**-2.59**
Household characteristics of respondent:								
Age of household head	-0.007	-0.45	-0.004	-0.17	-0.037	-0.51	0.004	0.23
Last grade completed by head	0.053	1.07	0.015	0.14	-0.724	-1.39	0.093	1.31
Craft skill dummy	0.184	0.51	0.213	0.32	-0.002	0.00	1.761	**2.43**
Permanent wage dummy	-0.083	-0.21	1.756	**2.01**	2.028	1.39	1.030	1.36
Household size	-0.033	-0.37	-0.072	-0.52	0.727	0.64	-0.192	-1.07
Wealth	0.036	0.59	-0.011	-0.09	0.021	0.23	-0.104	**-1.92**
Household characteristics of partner:								
Age of household head	-0.010	-1.05	-0.030	**-1.87**			0.687	0.90
Income level	0.172	0.79	-0.338	-0.91			0.089	0.11
Village dummies:								
Village 2	-0.083	-0.20	0.151	0.22	-3.843	-1.20	1.857	**2.68**
Village 3	0.461	1.08	1.212	1.44	0.862	0.76	-0.020	-1.10
Village 4	0.867	**1.85**	0.741	1.00			-0.791	-1.23
Intercept	1.908	**1.72**	3.211	**2.16**	11.465	1.63	3.953	**2.12**
Number of observations	443		140		38		141	
Pseudo R-squared	0.138		0.095		0.602		0.271	

The estimator is logit. The dependent variable is 1 if respondent expects more lending from current lender in the future.
Standard errors are adjusted for household clustering

Table A1. Determinants of Subjective Shock Measures

	Coef.	t-stat.
Acute sickness	0.279	**3.46**
Non-acute sickness	0.187	**3.16**
Ritual	0.682	**5.60**
Unemployment (head/spouse)	-0.071	-0.62
Unemployment (other member)	0.175	**2.09**
Village-time dummies	Included but not shown.	
Number of observations	618	
R-squared	0.380	