The informal credit market:

A study of default and informal lending in Nepal

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The thesis is submitted in the partial fulfilment of a Master degree in Economics

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University of Bergen, February 2005

Acknowledgements

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Map of Nepal

1. Introduction

Informal credit markets are still important in developing countries. Despite an increase in supply of formal credit in rural areas, informal lenders remain the dominant source of credit for the poorest households. Improvements in productivity are important in a development process. Productive investment requires funding and the access to credit is crucial for this purpose. Credit might also be a mean tide over bad times caused by sudden illness or an upcoming wedding for poor individuals.

This thesis studies the informal credit market in Nepal. In 2004 Nepal was ranked as number 140 out of 177 countries by the human development index (HDI) (Human Development Report, 2004). In 2002 the gross domestic product (GDP) per capita was only USD 1370. Nepal is one of the least developed countries in Asia.

Previous studies of the informal credit market demonstrate extremely high informal interest rates charged on loans to poor individuals. Extensive rural credit programs the last decades were intended to break the informal lenders anticipated monopoly power in the rural credit markets. Competition was expected to lower the informal interest rates. However, these policies do not seem to have improved the credit terms for the poorest households in rural areas. In order to make policies that can positively affect poor people's living conditions, we must understand how informal lenders set the interest rates. There exist competing explanations. One traditional explanation of high interest rates that opposes the monopoly view, that has motivated credit programs in the past, is the Risk Premium hypothesis. This theory argues that because there is a high share of default informal loans and lenders charge a risk premium to cover loss due to default. This risk premium can explain the interest rate gaps between formal and informal credit markets. We know about few previous studies of repayment in South Asia, and none from Nepal. A main contribution of this paper is therefore to provide data on default rates in Nepal. The data is based on field research conducted over two months in Eastern Terai. We made 114 interviews in five sample villages.

In chapter two we give a general description of informal credit markets in Nepal. Based on data from five sample villages and the Nepal Living Standard Survey from 1996 we see that

the characteristics commonly used to describe the informal credit market are typical for the informal credit markets in Nepal. We identify high and varying interest rates.

Chapter three presents theory that can explain high informal interest rates. (See e.g. Basu (1993), Basu (1997), Ray (1998) and Hoff and Stiglitz (1993)) Since we are not testing implications of a specific model, but rather focus on getting an overview of contemporary theory, we find it adequate to present models in details, only when this is necessary to put forward an important argument. Based on existing theory we outline three hypotheses that are able to discriminate between different views of informal interest rate formation in informal sector. They are: (1) The risk premium hypothesis (2) the searching cost hypothesis (3) The monopoly rent hypothesis.

Before the empirical evaluation of survey data we find it necessary to present the method of sampling and method used in the data processing. This is done under "data consideration" in chapter 4.

In chapter 5 we evaluate the three different hypotheses empirically. Firstly, we present the data and the findings from the village survey from Nepal. Secondly, we discuss how these findings correspond to some previous empirical studies of informal interest rate formation. (See e.g. Aleem (1993), Hatlebakk (2000) and Raj (1979))

Chapter 6 concludes.

2. A description of the informal credit market

The following chapter describes the credit market in Nepal. Based on our own field experience and data from the Nepal Living Standard Survey (NLSS) from 1996 we discuss whether characteristics commonly used to describe the informal credit market are typical for Nepal.[1]

2.1 Common characteristics

Empirical studies of informal borrowing and lending in developing countries have resulted in a list of common characteristics or "stylised facts" that is often used to describe informal credit markets in poor countries. Raj (1998) specifies six such features:

1. *Limited information:* Lenders have, more often than not, limited information about the borrower and how he spends the money.
2. *Segmented markets:* Relationships between borrowers and lenders are stable.
3. *Interlinkages between markets:* One often observes that interlinkages exist and the outcome in one market affects the outcome in a different market.
4. *High and varying interest rates:* Interest rates are higher than the lenders' opportunity cost of lending and may vary within each village.
5. *Credit rationing:* Lenders that are often not able to lend more at the going interest rate, but borrowers are willing to borrow more at the going interest rate.
6. *Exclusivity:* It is common that lenders refuse to lend to individuals that have outstanding loans with other lenders.

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[1] The Nepal Living Standard Survey (NLSS) from 1996 follows the Living Standard Measurement Survey methodology developed by researcher at the World Bank during the last fifteen year and is applied in surveys conducted in more than thirty countries. The NLSS data consist of a household survey and a village survey. In the household survey a random sample of 3373 households where interviewed. Out of these, 744 households were from 62 different wards (villages) in the eastern part of the ecological belt of Terai, the region where the 5 villages we visited is situated.

The Central Bureau of Statistics (CBS) has used the data from the household survey in the preparation of a two volume report. In this paper we refer to numbers from these reports, but also present some data from the original data set. See www.worldbank.org/lsms/country/nepal/nep96docs/html

Common for all these characteristics is that they are indicators of a credit market that diverts from a perfectly competitive credit market. In this chapter we discuss whether these features apply to the credit market in Nepal. Some of the features are more relevant for the analysis in chapter 5 and will be elaborated further in this chapter.

2.2 The informal credit market in Nepal

A paper by Chowdury and Garcia (1993) reports that the supply of formal credit to rural areas in Nepal increased from NR 806 million to NR 1480 million in the period between 1986 to 1990.[2] A large share of this supply has been channelled through rural credit programs. Despite an increased supply of formal credit, informal lenders are still the most important source of credit among the poor in Nepal. Formal lending institutions often require collateral like land from borrowers. The poorest households are often landless and therefore excluded from formal credit programs. The NLSS reports show that only 16 percent of lending in rural Nepal is obtained from formal institutions. A relatively high share of informal lending is also found in our samples; 60 out of 114 households have informal loans and 95 households have formal and/or informal loans. When we asked people why they do not borrower from formal institutions, the majority answered that they were unable to do so because they do not owe land. Other reasons given for avoiding formal credit are difficulties with illiteracy and high fees charged by officials.

Tab. 2.1 The main providers of informal credit

```
  5  Place |
 obtained |     Freq.      Percent         Cum.
----------+---------------------------------
 Relative |      130        25.79         25.79
 Landlord |       38         7.54         33.33
 Shopkeep |       15         2.98         36.31
 Money le |      310        61.51         97.82
    Other |       11         2.18        100.00
----------+---------------------------------
    Total |      504       100.00
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Source: NLSS dataset (1996)

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[2] NR= Nepali Rupees. 1st October 2003 the exchange rate equaled USD 1= NR 79.9.
Source: www.oanda.com/convert/classic

Table 2.1 show that the largest providers of informal credit found in the NLSS data set are a group termed "moneylenders". Moneylenders provide more than 60 percent of the informal credit. Moneylenders are informal lenders and these exclude landlords, shopkeepers, relatives and a small group of other informal lenders. In our study we distinguish between village lenders living in the village and market lenders living outside the village. Since shopkeepers, relatives and landlords can live both inside and outside a certain village we are not able to draw a clear parallel to the NLSS dataset on issues related to types of lenders. Village lenders are the largest provider of credit in our samples, but both types of lenders are active in the lending business in all the villages we visited.

In the five sample villages we found that most households borrowed for similar purposes like consumption, marriage and funerals.[3] 45 percent of the loans are taken because of consumption and 13 percent for marriage in rural Eastern Terai, according the NLSS data. Credit was usually given in cash, but sometimes in paddy (unprocessed rice), and expected to be repaid with interest rates after the next harvest when most households had a cash surplus. It might be difficult to calculate the value of informal loans because loans sometimes are given for four-ten months at the same rate of interest. Interest rates are sometimes reported on a monthly basis and sometimes on an annual basis. However, we found that villagers consequently do not use compounded interest and two percent interest per month therefore corresponds to 24 percent interest per year.

2.2.1 Limited information

Information problems typically occur in the credit market. Adverse selection, moral hazard and strategic defaults are potential problems.[4] Informal lenders must create contracts that minimise these problems.

In the sample we have 13 households which reported that they provide advance payments or cash loans to people in their village.[5] Most of these lenders are landowner with more than half a hectare land. In villages with few larger landowners we find that villagers had to get

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[3] Another student Guri Stenvåg at University of Bergen is currently working on a thesis about the purpose of borrowing among the poor in Nepal.

[4] Adverse selection, moral hazard and strategic default as result of information problems are discussed in the first part of chapter 3.

[5] Informal lenders are generally reluctant to talk about their lending business. In the first village we visited, Parsurampur, we were surprised that no one reported that they lend money. During the fieldwork we changed the way we asked about lending. This new approach to the topic was more efficient and we got more information from the suppliers of credit in the villages. The new approach is described in chapter 4.

loans from lenders outside the village, often in a nearby market area. Typical for lenders in the village are that they only lend to certain people. "Aphno Manche" is best translated to "our people" in English and is used by larger landowners and other more powerful people of relatively high caste to describe a certain group of workers or neighbours that they have a close relationship to. This relationship is often a work relationship, but also involves that the landowner has some sort of responsibility for the individuals' welfare and survival. The expression can frequently be heard during an interview when we ask the landowners about their lending activity. The landowners specify that loans are primarily given to "Aphno Manche", people they trust, and hence whom they know well. If they lend to people that are not "their people", the loans is often secured by a written contract. Villagers referred to a contract as a "tamsuk". We found that it is common practise to write a contract that states the double, or as in one village, the triple of the loans sum. In the contract the interest rate is only ten percent per year, whereas the actual interest rate is much higher. Written contracts are more frequently used by market lenders to secure a loan and they give the lender the possibility to take a borrower to court if he fails to repay the loan. We were surprised by this observation and made an informal interview with a judge in Morang District Court to confirm that these contracts are legal. See box 2.1 for details.

Box 2.1 The legacy of written contracts

Morang District Court, an interview with a judge

In Nepal private lending issues are settled in one of 75 district courts. In Morang the district court is located in Biratnagar. From mid July till mid November 2003 in total 71 cases concerning moneylending was settled in this court. The moneylenders won all 71 cases. The loans vary in size from 3000 to 1 million Nepali Rupees. The verdicts usually involve transfer of land properties. The land office is responsible for changes in owner registration.

In an informal interview the judge explains to us that if the borrower does not owe any land the lender can have the borrower imprisoned. However, the lender is responsible for feeding the convict during the imprisonment, and practically responsible for the convicts family as well. We ask if a "fake contract" that states the double or the triple loan sum can be legal by law, and the judge says, that any paper with two parts signature is legal. They are bound to follow what is written. 10 percent interest rate per annum is the maximum rate that can be claimed in court.

In court we had the opportunity to study the record of court cases and count the number of lending disputes settled in court over four months. We found that the number of court cases is relatively low and that there would be only a small calculated risk of being prosecuted in court because of a lending dispute. However, is interesting to see that a semi-formal credit market exists in Nepal where informal lenders can formalize loans. In one village we were told that lending cases were settled locally and that the Village District Community (VDC) Committee or other well respected members of the community judge in lending disputes. Villagers generally admit that they believe a lender will prosecute them if they default on a loan.

The market lenders' use of written contracts and the village lenders' criteria for providing loans indicate that there are information problems in these credit markets. However, the village lenders are better informed about certain people and these therefore prefer to lend to one of these. The market lenders that are not involved in any trade or other business in a village are equally uninformed about all the potential borrowers in the village and have to use other means to overcome the information problems like traditional screening methods, collateral, written contracts or middlemen.

In one particular village, Takuwa 3, we find that one market lender who dominates the credit market in this village use local and better informed middlemen to guarantee for a borrower's loan.[6] These middlemen are trade partners or previous or current employees of the moneylender and belong to his "Aphno Manche". Personal guarantee is not a new phenomenon and table 2.2, below, based on the NLSS illustrate that personal guarantee is *the* most common type of security on informal loans.

In the NLSS survey, personal guarantee can be the signature of a well-established businessman or landowner or witness of a good credit history.[7] This involves that personal guarantee will cover both written contracts and middlemen. The high share of personally secured loans suggests that these are both common phenomenon in Nepal. Less than ten percent of informal loans are secured with land. It may seem like a paradox that land is important in order to obtain a loan, but that it is not important as security.

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[6] A "ward" is often referred to as a village by the respondents themselves. For convenience we also prefer to refer to wards as villages. In most of the paper we talk about 5 villages, rather than 5 wards and 4 villages.
[7] The interviewers' manual pp. 86, see for a full version of the interviewers' manual: www.worldbank.org/lsms/country/nepal/nep96docs/html

Tab. 2.2 Security reported on informal loans

```
Kind of
collateral  |     Freq.     Percent       Cum.
------------+-----------------------------------
Agri. land  |        43        8.51       8.51
Building    |        10        1.98      10.50
Gold/silver |        15        2.97      13.47
Property    |        10        1.98      15.45
Personal gua|       128       25.35      40.79
Other       |        23        4.55      45.35
Nocollateral|       276       54.65     100.00
------------+-----------------------------------
     Total  |       505      100.00
```

Source: NLSS dataset (1996)

The NLSS reports show that in rural Eastern Terai 45 percent of the loans was secured by some kind of collateral. The use of collateral indicates that there is a potential risk of default that lenders attempt to reduce.

2.2.2 Market Segmentation

Market segmentation is a result of information problems. Village lenders seem to have well defined groups of people that they consider themselves close to. This means that these powerful landowners or lenders have specific preferences with regards to who they want to deal with. This results in a segmented credit market as well as a segmented labour market. Although our research showed that very few workers have permanent labour contracts in the sample villages, we found that many have repeated work and credit relations with a specific landlord or lender. In all the villages we visited we identified several segments within a village. These segments where usually geographically defined.

In one village, Takuwa 1, we found that a group of low caste workers worked for less than the average wage in the harvesting season. We asked them why they do not work for someone else instead and earn better wages. The villagers said that they benefited from remaining close to a certain landlord, living close by. Some stated that they were able to work for the landlord in off-seasons, while others said they were able to let their cattle grass on the landlord's property. It was obvious that these stable relationships with landlords where considered as a kind of insurance by this group of poor low caste people. In other words stable relationships were necessary to obtain credit within the village.

2.2.3 Interlinkages

The discussion on market segmentation is closely related to interlinkages. In the introduction we defined interlinkages as a situation where the outcome in one market affects the outcome in another market. Such kinds of multiple relations are often found in informal credit markets. In the sample villages from Nepal we saw that village lenders were employers, shopkeepers, local paddy trades or mill owners. This involves that a lender usually deals with a borrower in at least two different markets. In addition to the informational advantage of knowing a potential borrower well, interlinkages give the lender the opportunity to indirectly reclaim debt through another market transaction. The example from Takuwa 1 where villagers work for less than the market wage can be an example of interlinkages if parts of the wages are kept by the landlord as instalments on a loan. We also hear stories of people that have worked for free in the off season to pay off debt. There are possible advantages of an interlinked contract for both the borrower and the lender. The lender can make the borrower work for lower wages and the borrower ensure a close tie to a specific employer. Since interlinkages are not a main topic we did not get enough details on interlinkages to examine this topic further.

2.2.4 High and varying interest rates

Table 2.3 below show that the average interest rate on informal loans in rural Eastern Terai, is 40 percent per year. This is above the formal interest rate which at the time of our research was 18 percent per annum on loans from ADB.

Tab. 2.3 The average interest rate and loan size in Eastern Terai

Variable	Number of obs.	Mean	Std.Dev.	Min	Max
Interest rate	385	40	20	0	84
Loansize	504	7695	13068	1000	150000

Source: NLSS dataset (1996)

The interest rates vary from zero to 84 percent. The zero percent interest loans are in 53 percent of the cases given by relatives and in 30 percent of the cases given by the group moneylenders. Zero interest loans are interesting because they are loss contract. A lender could be better off investing the money in alternative ways. We think that zero interest loans are altruistic. The loans vary in size from NR 1000 to NR 150 000. A plot diagram of all the

504 informal loans from rural Eastern Terai show that there is no obvious correlation between interest rate and loan size found in the data (see fig. 2.1, below). The lack of correlation is especially obvious for relatively small loans.

Fig. 2.1 Reported interest rates versus loan size
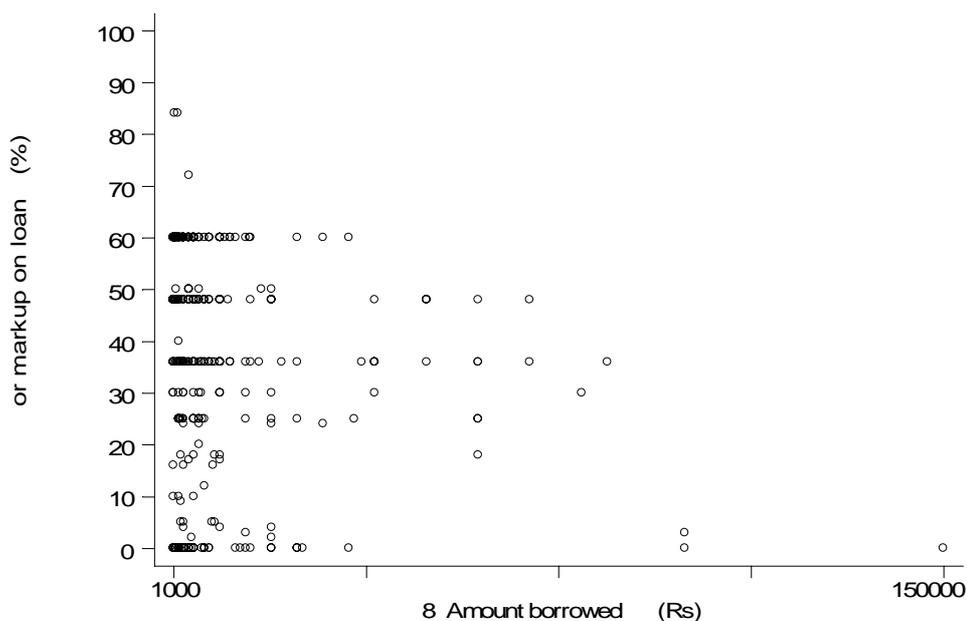
Source: NLSS dataset (1996)

In figure 2.1 there seems to be only a small tendency that interest rates increase with loan size. The NLSS data shows that there is no clear difference between the interest rates charged by different types of informal lenders either. The results are available as plot diagrams in appendix C

In the five sample villages from Nepal we found that interest rates vary form zero percent to 120 percent per year. Table 2.4 present details from each village. Since villages are chosen based on certain criteria we cannot immediately generalize the results. To keep the validity of the data we keep the data on village level. We therefore consider the data valid only at village level.[8]

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[8] The samples from each village are random, but the sample of villages are non random. The criteria for the choice of villages are presented in chapter four under the section on primary data.

Tab. 2.4 Variation in interest rates, by village

Village	Number of observations	Mean*	Std.Dev*	Min	Max
Banigama2	11	29	16	0	48
Ghuski2	9	72	26	36	120
Parsurampur2	14	44	11	25	60
Takuwa1	20	41	25	0	120
Takuwa3	13	95	41	0	120

*To the closest whole percentage

Source: Fieldwork 2003

The average interest rates in the villages vary from 29 percent in Banigama and up to 95 percent in Takuwa 3. We observe that the average interest rates varies between the villages, but that all the mean values are above the formal interest rate at 18 percent and also above a defined opportunity return of 25 percent which we use as a benchmark in chapter five.

Banigama was the most developed village we visited. Unlike the others, this village lies in a market area and the majority of the respondents have other jobs than farm work. In our fieldwork we paid much attention to the contradictions between Takuwa 1 and Takuwa 3. The inhabitants in these two neighbouring villages face very different terms of credit. The average interest rate in Takuwa 3 is more then double of the average interest rate in Takuwa 1. We mentioned earlier that in Takuwa 3 there are few village lenders and the majority of the villagers borrow from the same person living in the market area near the village that charges 120 percent interest rate. This moneylender uses middlemen form the village to acquire local information about potential borrowers. In comparison we find a number of active lenders within the village in Takuwa 1. We think that the number of lender is determined by the number of larger landowners in the village. There are more big landowners in Takuwa 1 than Takuwa 3.

In the NLSS data find no obvious difference between different types of lenders. In our study, however, we distinguished between two types of lenders. Table 2.5, below, describes how the mean interest rate varies between informal village lenders and informal market lenders. The results suggest that there is in general no significant difference, except for Takuwa3. A regression also shows that the type of lender cannot explain any variation in

interest rates in four out of five sample villages.[9] Hence, market lenders do not charge significantly higher interest in the villages we visited.

Tab. 2.5 Interest rates dependent on type of lender, by village

Village	Village lender		Market lender	
	No. Of observ.	Mean interest	No. Of observ.	Mean interest
Banigama1	7	29	4	30
Dhuski2	5	79	4	63
Parsurampur2	11*	45	3*	40
Takuwa1	17	41	3	41
Takuwa3	4	55	9	113

 *We lack information about interest rate for 2 observations in Parsurampur2

2.2.5 Credit rationing

In all 5 villages we find that both village lenders and market lenders provide credit. Village lenders we argued are better informed about individual households and have an advantage compared to the market lenders. We think that village lenders will be able to offer contracts that are preferred by the borrowers and subsequently squeeze the market lenders out of the market if they want to increase their share of the lending market. That this does not happen indicates that there can be limited supply of credit within a village. The excess demand for credit in villages attracts lenders from other villages and market areas to invest in the local village credit markets. During interviews with providers of credit in the village several specifies that they are farmers and not moneylenders. We get the impression that they have no interest in expanding their lending activity. From villagers that are not lenders some tells us that they believe lending is a good business and that they dream of becoming moneylenders. However, there are most likely capacity constraints of credit in the villages.

2.2.6 Exclusivity

In Nepal we find that many borrowers have loans from different lenders. In Takuwa we saw several examples of households borrowing from three or four different in order to finance, for example, a wedding. The respondents say that they could not get a larger loan from one lender and therefore borrowed from several. Exclusivity is not obvious in Nepal. This

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[9] See appendix B for the result from the linear regression. Only in the case of Takuwa3 the t-value was significant for type of lender affecting interest rate.

observation also indicates that the market segmentation that we described above is not perfect. There must be overlaps between the segments that different lenders operate within.

2.3 Summary

In this chapter we showed that many of the common characteristics of the informal credit market are also typical for the informal credit market in Nepal. We identified high interest rates in all the sample villages and large variation in interest rates both between and within the villages. Information problems seem to be closely related to both the market segmentation and the interlinkages that we observe. Since exclusivity is not obvious we think that there are large overlaps between the segments. *Important findings are that village lenders and market lenders charges on average equally high interest rate and that there does not seem to be a clear correlation between the size of a loan and the interest rates.* The use of middlemen and written contract as ways to reduce the information problems are topics that we think are interesting and that got much attention during the fieldwork. These topics are relevant in the discussion of security and liability in chapter 5.

3. Theoretical Approach

There are several theories that attempt to explain the characteristics of the informal credit market outlined in the previous chapter. Standards economic theory assumes perfect information, perfect contract enforcement and heterogeneous borrowers and lenders. Based on these assumptions credit markets are modelled perfectly competitive, which results in zero profit in equilibrium. Based on this model we should expect to observe one equilibrium interest rate in one region reflecting the interception between demand and supply of credit in the area. However, empirical studies of the credit market in developing countries demonstrate the existence of a dual credit market and prove a gap between formal and informal interest rates charged within the same region. Our field experience confirms these findings. It is puzzling that such a set up does not cause arbitrage between the two sectors.

Why does our Homo economicus not take this opportunity to earn some easy money by borrowing in the urban market and lending in the rural one?(Basu, 1997, pp.267)

Basu argues that if enough people saw this opportunity the informal interest rate would fall and the formal interest would rise until equilibrium is restored. The fact that, this does not happen, seems to render the standard competitive theory powerless when it comes to explaining the high informal interest rates.

Attempts to find alternative explanations for the characteristics that we observe in the informal credit market have resulted in a vast literature on the topic. Depending on the approach, these theories emphasize different characteristics of the credit market, such as interlinkages, market segmentation, high informal interest rates, credit rationing, risk and information asymmetries. The ideal is to find a model that is able to capture as many of the characteristics as possible. Typical for much of the new theories are that they are based on more realistic assumptions about information and enforcement, than the classical competitive theory. Imperfect information and enforcement problems are signs of market imperfections and result in a potential risk of default and possibly monopoly power in the informal credit market.

3.1 Imperfections in the credit market

The basics of lending are to provide a loan today and get it repaid, usually with an interest rate, some time in the future. This natural time delay in a debt contract, as compared to an instant exchange of two goods, makes lending potentially risky (Bardhan and Udry, 1999). A credit contract involves a promise of future payments. Unless the provider of credit can ensure that this promise is kept in the future, there will always be a risk that the promise is not kept, and hence, repayment can fail. In formal credit markets in well-developed countries these problems are largely overcome by strong legal enforcement in combination with some kind of collateral and information databases where information about individuals' creditability is stored and equally available for all lenders. In developing countries such devices are not readily available and formal lending institutions are usually not willing to lend to poor individuals who are landless and with an unknown credit history.

In developing countries we observe that individuals that are unable to get loans from formal institutions can still obtain credit from informal lenders. This indicates that informal lenders are able to handle information- and enforcement problems.

In a credit market there are typically asymmetric information between a borrower and a lender, where borrowers have full information about their productivity and their risk types, but a lender lacks this information. This kind of information asymmetries may be captured in a standard principal-agent model. When borrowers have private information about their risk types, the lender is facing an adverse selection problem. Adverse selection is a pre-contractual problem and we refer to this as the lenders *screening problem* later in the thesis. If post-contractual action by the borrower is not verifiable for the lender, the problem is called moral hazard. This problem can be thought of as a monitoring problem and we refer to this as the *incentive problem*.

A third related issue concerning lending is the *enforcement problem*. This concerns the borrower's repayment decision. A lender must take actions to increase the likelihood of repayment when repayment is possible and thereby avoid *strategic default*. When projects fail and loans are defaulted on for unpredictable reasons like sudden illness, death and bad weather conditions it is referred to as *involuntary default*. This means that even if a lender

has full information about a borrower there might be an enforcement problem, and a potential loss, due to involuntary default.

We see that potential risk of default arise because of incomplete enforcement and asymmetric information between borrowers and lenders. Informal lenders can reduce this risk of lending by spending time and resources on screening and monitoring. All costs associated with a reduction of this risk are referred to as *searching costs*. Costs associated with default are termed *risk premiums*. Both searching costs and risk premiums adds to the transaction costs of lending. It is useful to keep the searching costs and the risk premiums separate, because risk premiums can be positive even when lenders have full information about borrowers.

In a credit market there may exist, another kind of asymmetric information. If one lender is better informed about a potential borrower's creditability than another lender, or typically has better access to this information, we may find that there is asymmetric information between lenders in the credit market. This kind of information asymmetries possibly limit the competition between lenders and enable the better informed lenders to act as monopolists.

3.2 Theory of high informal interest rates

In this part we introduce theory that can explain high interest rates in informal credit markets. To understand what causes high interest rates and how an interest rate gap sustains between the formal and the informal sector in most developing countries we need to understand how the informal lenders set the interest rates. Above we discussed how information asymmetries and enforcement costs can adversely affect the credit market. Different theories provide alternative explanations of high informal interest rates depending on the assumptions made about information and enforcement problems. We present six different approaches: Pure risk premium theory, a competitive view, a standard monopoly outcome, a monopolistic competitive theory, theory of credit rationing and the theory of fragmented oligopolies. We start by presenting three models that represent the two most extreme predictions of interest rate formation; a perfectly competitive outcome and a standard monopoly outcome. The other theories represent intermediate views.

3.2.1 A pure risk premium model

One traditional explanation to the high interest rates in informal sector is the Lender's Risk hypothesis (see e.g. Basu, 1997). The interest gap between the formal- and the informal credit markets is explained by high default rates and a risk premium paid by the borrowers. This theory describes a competitive credit market with possible information problems and enforcement problems. There is no mechanism of risk reduction in the theory. This theory belongs to a group of cost pricing models of interest rate formation. The equation 3.1 below represents the zero-profit condition for a lender. In this equation r is the formal interest rate and the lender's cost of capital, i is the informal interest rate that clears the market, and p is the fraction of loans repaid. L is the loan size assumed to be 1 a numerical example.

$$(1+i)Lp = (1+r)L \qquad \text{eq.3.1}$$

If a lender can borrow in the formal credit market at 10 percent interest per year and re-lend the cash in the informal market at 120 percent interest per year only a default rate of as high as 50 percent can satisfy the zero-profit condition above. If there is positive profit in the market the theory argues that competition will bring the informal interest rate down to the zero profit level.

3.2.2 The competitive view

A competitive view of an informal credit market is often associated with the "Chicago School" (Hoff and Stiglitz, 1993). It argues that the high interest rates reflect risk premiums or searching costs. We defined these costs in part 3.1. In this "perfect market" it is a pre-assumption that credit markets are approximately Pareto-efficient. However, this can only be valid if the private costs and the social costs of acquiring information are the same. More precisely, this means that it is not possible to privately acquire complete information and hide it from others. This is hardly justifiable if there are asymmetric information between lenders or between borrowers and lenders. The Chicago School view of the credit market fails to consider the competitive aspect of information problems.

Whenever there is a risk of default or a share of loans that are defaulted on the lender can ask borrowers for collateral to avoid a loss. We assume that the value of collateral is a function *(F)* of land value *(V)*. The value of the loans with interest rate is *(1+i)L* as above.

We assume that there is only a probability, *p,* less than one, that a given loan is repaid. Equation 3.2 below represents the lenders expected income and to avid loss the expected income must equal or exceed the value of the loan at a given time.

$$(1-p)F(V) + p(1+i)L \leq (1+i)L \qquad \text{eq.3.2}$$

Solving equation 3.2 we find the full liability condition that must hold to prevent the lender from facing a loss contract;

$$F(V) \geq (1+i)L \qquad \text{eq.3.3}$$

When a rational borrower makes the repayment decision he compares the gain of default with the cost associated with the loss of collateral. If the value of collateral, her equals or exceeds the value of the loan a borrower will have incentives to not strategically default on a loan. In case of involuntary default the lender take over the ownership of the collateral. Equation 3.2 ensures full enforcement and that a borrower is not able to get away without repaying the loan or an equivalent value of collateral.

Whenever the liability condition 3.2 fails, there is obviously limited liability, because the collateral or the security only covers parts of a defaulted loan. A complication arises when the borrower and the lender value the collateral differently. The necessary condition for full repayment to be in the interest of both parts is equation 3.3.

$$F(V_{lender}) < (1+i)L < F(V_{borrower}) \qquad \text{eq.3.3}$$

The lender must value the collateral less than the borrower (See Ray, 1998 pp. 547 for more details). It is realistic to believe that a lender with large landholdings value a small piece of land less than a poor farmer with a very small plot of land. It is probably only in special cases that this condition fails, for example when the small plot is adjacent to the large farmers land, or highly productive land. Another condition when collateral could fail to secure repayment is when a borrower uses the same collateral to secure loans from different lenders.

Collateral can explain how informal lenders might be able to solve information problems and enforcement problems, but it is not obvious how this can be related to high interest rates. If collateral is available to all lenders, at the same cost, and the use of collateral ensure full liability, we would expect the informal credit market to be competitive. In that case this full-liability theory can only explain high informal interest rates if there also are high transaction costs involved in providing loans.

3.2.3 The Monopoly view

We introduce the other extreme of views on the informal interest rate formation. When asymmetric information between moneylenders exists, we expect that some lenders have advantages lending to certain people. This gives a lender market power in a segment of the market where he is better informed than any competing lenders. When a lender is the single best informed lender, or the only lender providing loans in the area, this lender is also likely to have enforcement power. Even in the absence of collateral and threat of physical punishment, a single lender can make sure that any borrower that defaults on a loan is excluded from future credit. When the cost of exclusion is higher than the cost of repayment, this threat will give the borrower incentives to not strategically default on a loan. In a paper on informal insurance arrangements, Coate (1993) shows that repeated interactions are efficient risk sharing arrangements in informal markets. This implies that a borrower that is repeatedly dependent on credit to shed over bad tides will not default on loans because of the treat of future exclusion from the market.

A single lender can use a pure monopoly strategy lending to people when there is no information and enforcement problems. In a standard monopoly outcome the price, here the interest rate, is higher than the competitive level and the monopolist is thus earning positive profit.[10]

What happens if the monopolist is not able to overcome the enforcement problem? This means that some loans are defaulted on. We examine the effect of default in a standard monopoly model and identify two obvious effects. The simple result is based on the assumption that default rate is independent of loans size. It might be more realistic to

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[10] Pure monopoly strategy: The moneylender offers a contract (i,L*), where the interest rate (i) charged is above the competitive level and the loansize (L) is rationed. The lender chooses L where marginal cost (MC) equals marginal revenue (MR). The interest is determined by the borrowers demand for credit (See e.e. Varian (1999), *Intermediate microeconomics,* pp. 423 figure 24.5).

assume that larger loans are more likely to become defaults. However, in this model we keep things as simple as possible.

Fig. 3.1 A monopolist's reaction towards default
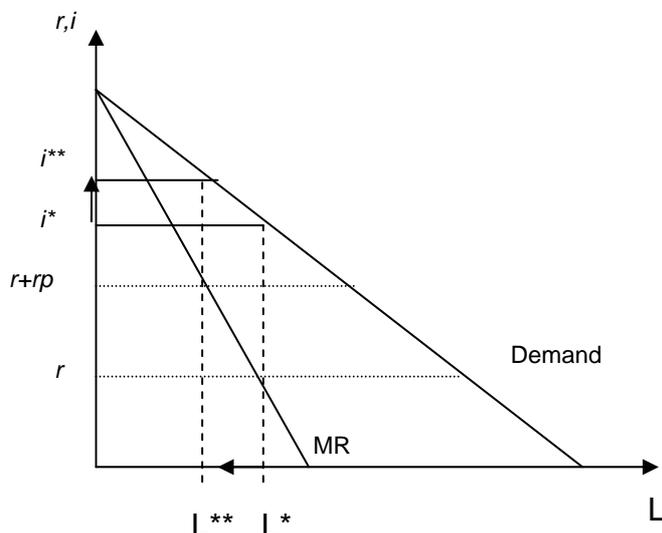
We assume in this model that the marginal cost of lending (MC) equals the formal interest rate *r*. A positive default rate results in a higher MC of lending for the monopolist. In figure 3.1 this effect is shown by an increase in MC with the size of the risk premium, *rp*. The new interception between the MR and the new MC, determine the monopolists new profit maximising level of credit and interest rate. This new interception is higher on the MR curve and results in an even higher interest rate than before. The second effect is a reduction in demand for credit as a result of the increased price. For the monopolist default involves less monopoly rents.

3.2.4 Monopolistic Competition

If a lender's market power is limited new lenders will be attracted to the market if the informal interest rate lies above the new lender's average cost (AC) of lending. Competition from the new lenders will bring the informal interest rate down to these lenders' AC. However, if one lender faces lower transaction costs due to either information or enforcement advantages this single lender has a lower AC than his competitors and will be able to squeeze his competitors out of the market again by bringing price just below the competitors AC. This kind of situation is often described as a monopolistic competitive market outcome. This theory implies that interest rates reflect the transaction costs of

lending. In equilibrium the interest charged will be lower than in a pure monopoly. The lender with information and enforcement advantages can still earn some profit in equilibrium. The competitors, on the other hand, are willing to stay in the market until their profits are zero. This theory has been presented in Bardhan and Udry (1999).

Next we describe a model used by Hoff and Stiglitz (1997) in some details to investigate the interest rate formation in a model of monopolistic competition where enforcement costs are specified.

A moneylender, once he has screened an individual and assessed the likelihood of repayment, is an imperfect substitute for any other moneylender. Therefore, if there is free entry into money lending, the market is appropriately modelled as monopolistically competitive. If the marginal cost of money lending rises for some reason, then the equilibrium interest rate charged will increase. (Hoff and Stiglitz, 1997)

In this model the authors argue that problems of enforcing contracts are common in developing countries, but that there seems to be relatively free entry into the market, although some lenders have advantages enforcing debt contracts. The authors claim that a monopolistic competitive model can best describe features of the informal credit market. The model should originally shed lights on the effect of increased formal subsidized credit in the rural credit market. Nevertheless, the model is useful in the discussion of interest rate formation.

The equilibrium condition is characterized by two conditions: Zero-profit implying average cost (AC) per unit lent equals the interest rate, and profit maximization implying that the elasticity of the average cost curve equals the elasticity of the demand curve. The latter condition ensures tangency between the AC and the demand curve. It is assumed that the demand curve is downward sloping and that the AC curve is U-shaped. The U-shaped AC curve reflects the view of the authors; that scale economies operates strongly at the level of variable costs. This is further supported by the empirical-based study by Aleem (1993).[11]

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[11] More on Aleem (1990) in chapter 5.

Aleem (1993) presents a "Chamberlian theory" of a monopolistically competitive credit market based on a study of 14 market lenders in the Chamber region in Pakistan. He finds that an increase in default, or an increase in marginal cost of funds, e.g. the formal interest rate, increases the interest rate. This last statement regarding the positive correlation between formal interest and marginal cost of lending is reversed by Hoff and Stiglitz who argue that an increase in the subsidised funding will decrease the opportunity cost of funds, but lead to an increase in marginal costs of lending. More and cheaper credit available for moneylenders is likely to attract new lenders and increase marginal cost. The authors model three different situations where this might be true. We briefly describe the argument intuitively: (1) New entry reduces each lender's share of the market and forces him to operate at a higher marginal cost.[12] (2) New entry gives a borrower more choices, then adversely affects it's incentives to repay. This increases the marginal cost of the lender through higher default or higher enforcement costs. (3) New entry weakens the information sharing among lenders, and reduces the effect of reputation that at a smaller scale can have a positive incentive effect on the borrower. High interest rates in this model are explained by transaction costs. An increase in formal subsidies causes an even higher informal interest rate.

3.2.5 Fragmented oligopoly

A different approach to model the informal credit markets has been to assume that two lenders act as monopolists in respectively segment, (S_1) and (S_2), then competes in a third segment, (S_3) This market simulation gives another outcome, considerable more complex than the monopolistic competitive outcomes mentioned earlier. An attempt to model such a fragmented market has been presented in Basu (1997). A fragmented market can neither be modelled as several standard monopolies nor a standard oligopoly.[13] To model a fragmented oligopoly, Basu argued, seems to be a closer verge on reality. Basu's model can be used to analyze the interest rate formation in fragmented markets. When the price function is concave Basu proves that equilibrium interest rate charged will be less than a monopoly, but higher than in an oligopoly. A similar idea is described in Basu and Bell (1991) and Hatlebakk (2000). Hatlebakk tested this outcome on cross sectional household data from Nepal. He finds that the model is useful in explaining high interest rates in the rural credit

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[12] See fig. 2 in Hoff and Stiglitz (1997)

[13] Standard Oligopoly: In a oligopoly a lender is maximising profit, taking into consideration, a second lender's actions. The result is a interest rate above the competitive, but below the monopolistic interest rate.

market where default rates are relatively low.[14] His model predicts that in villages with low lending capacities the interest rates are determined by the demand for credit and lenders can earn positive profit. This means that high interest rates in a capacity constraint village might not correspond to transaction costs. In villages with higher lending capacities one can expect interest rates to proceed towards a competitive level. Hatlebakk also looks into the possibility of price collision in village with high lending capacities (See. Hatlebakk (2000) figure 1 for details). This model can also explain variation in interest rate between villages.

3.2.6 Credit rationing

Stiglitz and Weiss (1981) developed a model of credit rationing in a formal credit market. This model is also useful in a study of the informal credit market. The authors assume that lenders are have limited monopoly power. They assume that a borrowers willingness to pay high interest rates reflect a borrower's risk type. This positive relation between risk of default and interest rate give lenders incentive to ration credit. In equilibrium Stiglitz and Weiss argue that there might be borrowers that are willing to pay an even higher interest rate than the market rate. However, because these are all high risk borrowers the lenders will not raise the interest in order to induce a riskier group of clients. This model originally argues that informal interest rates might be lower than the equilibrium interest rates.

In a competitive aspect, the model can also explain high interest rates. Because of the relationship between risk and interest rates the lenders lack incentives to lower interest rates in order to steal another lender's customer. This might seem like a contradiction to the previous arguments, but Stiglitz and Weiss explains it in the following way:

If a bank tries to attract the customers of its competitors by offering a lower interest rate, it will find that its offer is countered by an equally low interest rate when the customer being competed for is "good" credit risk and will not be matched if the borrower is not a profitable customer of the bank.[15]

This argument depends on the assumption that the lenders know who their most creditworthy customers are. Interest rates can reflect both costs and monopoly rent in this model.

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[14] A report of "low default" from this thesis would strengthen Hatlebakk's conclusions.
[15] Stiglitz and weiss (1981), "Credit rationing" in *The American Economic Review*, Vol. 71, No.3, page 409

Another example of credit rationing has been modelled by Bell (1990). He models the interactions between formal and informal credit institutions. This model shows that when formal credit is rationed, and the informal lender is able to offer a contract (L,i) that are preferred by the borrower, there is a spill-over of demand in the market. This means that if formal institutions do not do not give as much credit as a borrower desires the borrowers will turn to informal lenders. Bell has data from Punjab in India that supports this conclusion. Bell shows that the informal interest rate in equilibrium might be higher than the formal interest rates, depending on the default rate and the cost of entry for new moneylenders and hence the level of competition. The model is of particular interest because it is a unified model that can be used to analyse several special cases, both of the cost pricing hypothesis and the monopoly theory. This dichotomy is the main focus as we proceed.

3.3 Competing explanations

The three factors transaction costs, risk and market power are typical for theory that can explain the interest rate formation in informal credit markets in developing countries. These are factors that make it inappropriate to use the standard competitive model to describe these markets. We can depart from the competitive model in two directions that each may explain why we observe high and varying interest rates in informal credit markets:

a) High interest rates are mainly due to monopoly rents. Moneylenders have monopoly power in a segment of the market and can charge interest above marginal cost of credit on their loans.

b) High interest rates are mainly due to high transaction costs. Implicit in this explanation will be that money lending is a relatively competitive business where the interest rate reflects searching costs and/or a risk premium.

The basic idea is that in equilibrium the difference between the informal interest rate (i) and the commercial interest rate (r) is explained by searching costs (sc), monopoly rent (mp) or a risk-premium (rp).

$$i - r = sc + mp + rp$$ eq. 3.4

Equation 3.4 indicates that the high interest rate can be explained by a single factor or by a combination of two or all three of the factors in the equation. To determine whether risk premiums, searching costs or monopoly power dominate in the interest formation in Nepal we need to find ways to empirically discriminate between these competing views.

3.5 Developing empirically testable hypotheses

The theory that we have presented in this chapter suggest that how high informal interest rates are set, depends on the level of competition and the possibilities for lenders to earn monopoly rent in the informal sector. A competitive credit market is characterized by free entry. The high interest rates reflect transaction costs. In this case the interest rate gap between the rural and the urban sector is explained by searching costs, enforcement costs or a risk premium. Variations in interest rates across villages are due to variations in lending costs between these villages. Put differently, if a lender faces no competition the interest rates may reflect monopoly rent. When a monopolist faces a positive rate of default, this may result in an even higher interest rate. A positive default rate can also be an indicator of limited market power. The monopolistic competitive theory suggests that if new lenders can enter the market at some cost, no lender can charge interest rates above the competitors' average cost of lending without facing competition. Monopoly rents are also possible in villages that are characterized by capacity constraints.

We present the three following hypotheses concerning interest rate formation;

(1) The risk premium hypothesis

If there are no defaults observed in the informal lending market this implies that risk premiums cannot explain high informal interest rates. Contrary, if there is a positive default rate we cannot ignore that risk of default and risk premiums affect the informal interest rate formation. A necessary condition for the risk premium hypothesis is a positive rate of default in equilibrium.

(2) A searching cost hypothesis

A necessary condition for a searching cost hypothesis is information and/or enforcement problems. When informal lenders spend time and resources on solving the screening-,

monitoring- and enforcement problems, then there are searching costs involved in lending, and we cannot reject the searching hypothesis.

(3) The monopoly rent hypothesis

If there is one single lender operating in a market or a segment of the market, this lender is a potential monopolist and high interest rates can therefore reflect monopoly rent. If there are two or more lenders in the market and these do not cooperate the hypothesis is rejected and the interest rate can only reflect the cost of lending and the market is thus monopolistically competitive. However, the latter is only viable if the interest rate reflects the sum of risk premium and searching costs. A necessary condition for monopoly rent is cost of entry or capacity constraints.

In the following we draw on data from the field experience to test the relative explanatory power of these three hypotheses.

4. Data considerations

The empirical evaluations in chapter five are essentially based on knowledge obtained from a primary data source. This chapter describes the sampling method and discusses briefly the quality of the survey data. In order to determine a default rate on loans in the sample we classify loans in seven categories according to the likelihood that they are loss contracts. The specific criteria we use for each category are summarized in a separate section below.

4.1 Primary data

The survey data were the collected over two months in the Eastern Terai of Nepal during the autumn of 2003. Because of the ongoing conflict between the government and the Maoist oppositions we found that we had to be especially careful. We decided to stay in bigger cities instead of smaller market areas and do day trips to the villages. This geographically limited the areas where we were able to do research.

4.1.1 The village samples

We did in total 114 interviews in five villages. The villages were chosen on the basis of certain criteria. Since the fieldwork lasted only about 2 months, we wanted to visit villages that were of particular interest given our research topic. Using the NLSS survey we identified villages in Eastern Terai, with respectively low wages, high informal interest rate and low caste groups that we felt were of interest.[16] The non random choice of villages implies that the results cannot immediately be generalized to represent all villages in the region where we did research.

The sample of individuals from each village was randomly chosen from the most recent voters' list available. This implies that data must be considered valid at village level. Details on the random samples can be found in table 4.1. We obtained information through personal

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[16] To single out the villages in question, we list the villages that fit the following two criteria: 1) There are at least 10 workers in the sample that are in the group of muslims, sarki or the combined category of other ethic groups. The data show that these groups earn the lowest wages. 2) The villages have an average unweighted wage of less than NR 34. Among the villages with these criteria we chose to visit villages that could be accessed by car and that lied close to an urban area, where we felt it was safer to stay because of the security situation in Nepal at the time of the fieldwork. In addition we look at the interest rate that should be above 25 percent.

interviews, with an interpreter, who was not from the village. In most cases the interviews were carried out in the local dialect, however, in a few cases when the respondent was familiar with Nepalese, this was the language used. We used a pre made questionnaire with questions about the household members, landholdings, production, the labour market and the credit market.[17] In the end we added informal open-ended questions. Each interview lasted around one hour.

Tab.4.1 Details on the village samples[18]

Village Name	District	Ward Number	Number of households	Rule of Sample	Sample Size	Missing observations
Banigama	Morang	2	Unknown	Unknown	19	0
Dhuski	Sunsari	2	130	1/6	22	10
Parsurampur	Bara	2	Unknown	Unknown	23	0
Takuwa	Morang	1	Approx 180	1/7	25	5
Takuwa	Morang	1	Approx 180	1/7	26	4
Takuwa	Morang	3	87	1/4	21	2

In each household we asked for the head of the household. In most cases this was the husband. Whenever the head of household was unavailable we asked for new appointment whenever this person was available. However in some cases he was out of the village or for some other reason unavailable. In these cases we talked to a son or the wife depending on who knew most about relevant household issues.[19]

Two major problems concerning the reliability of the data set from Nepal are errors that occur because of language difficulties and strategic answers. In the villages we were often mistaken to be representatives from a development agency or aid donors. We tried to enfeeble this misunderstanding by introducing the project and ourselves as students carefully in the beginning of each interview. We also used interpreters not from the village to ensure their objectivity to the result of the study. Whenever interviews are translated this always involves a risk of misinterpretations and misunderstandings. To limit the scope of

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[17] See Appendix A for a full version of the questionnaire.

[18] In some villages we failed to obtain the exact number of households in the ward. Details on the principle used when choosing some samples have also by mistake not been recorded in two villages. We write unknown where information is missing. In some wards respondents in the sample had moved, died or refused to talk and the numbers are recorded under missing observations.

[19] The decision is usually unproblematic. Whenever the son is grown up and able to take on responsibility, he was running the business. If the son was too young the wife was in charge of the household.

language problems we used field assistants that were familiar with the local dialect of Nepali in the region where we conducted the research. We also rehearsed the interview process before doing interviews in the villages to make sure that the field assistants were familiar with the questionnaire.

4.1.2 Information from lenders

In addition to the sample, we made a number of extra interviews with moneylenders. We experienced that lenders are generally reluctant to talk about their lending business. Much of the information we have about the lending activities in rural areas of developing countries are based on information from the demand side of the credit market. Interest rate, loan size, collateral and even repayment are easy to obtain information on by asking the borrowers. However, when seeking information on screening, risk evaluation or for example indirect payments the lenders are likely to be better informed than the borrowers.

In the first village we visited no one reports being involved in lending activities. We were puzzled by this and assumed that something was wrong with the approach that we had to the topic. When interviewing potential lenders in the second village we did not ask directly whether someone was lending money. Instead we kept asking about borrowing. The idea is pretty straight forward. We ask about any formal or informal borrowing and where they get loans. When land is available, it is easier to obtain loans. The next step was to ask what possibilities there are to borrow money if one lacks assets like land. This is the crux of the strategy. Most respondents said that they had to turn to landlords or employers, relatives or neighbors. If the respondent earlier had reported being an employer of landlord- we followed up with whether his employees or peasants ever asked for credit. With this approach it became difficult for the potential lenders to not admit actual lending. However, we have to accept that some lenders were unwilling to go into any details on the matter.

This method works well because as long as the respondent lacks information about the interviewer's knowledge and intention of asking a specific question, the respondent will not have incentives to avoid honesty. Therefore as long as we can "hide" that we are well informed about the role and behaviour of lenders in rural credit markets and do not give the lender a suspicion of the direction of the next question, we may get answers to some of the questions we are interested in. Other advantages with this method, other than the informational aspect, are that the conversation can be kept rather informal, although

structured, and that it gives us a more polite and less abrupt way to approach a sensitive topic.

4.2 Recording data

All answers are registered in the questionnaire and later put into a MS Excel worksheet. The working sheet is later transferred to Stata for analysis. To make the data more comprehensible we had to make some critical decision about how we transfer detailed data from the questionnaires into the Excel working sheet. We summarize the assumptions that we find questionable below.

- **Loan size:** If the loan was taken in paddy (unprocessed rice), the value of the loan is written in this column. The price of paddy varied with seasons and the price was lower during the harvest time when it is readily available. In Parsurampur the price of 1 Mon (20Kg) paddy was NR 200 after the harvest and NR 400 in other seasons. In Banigama the price varied from NR 250 to NR 400. Similar variations were found in the rest of the villages. As a common average we assumed that the value of 1 Mon (20Kg) paddy equals NR 300 whenever a loan was taken in paddy.
- **Land:** Land was reported in local measures of Dur, Khatta and Bigha.[20]
- **Lender:** We define two categories of lenders; v (village) and m (market) dependent on whether the lenders were resident in the village or from other villages or a market area. Credit providers from other villages were recorded as market lenders.
- **Security:** We register six kinds of security as dummy variables in the working sheet. The list below gives the definitions of each of these variables.
    1. Mortgage: Mortgage means that as long as a loan is outstanding the lender is entitled to use of a plot of land.
    2. Land/gold: Land was only assumed to be available as collateral when the respondents reported that they have more than 2 Khatta land, or owed some agricultural land in addition to house land. By using "no land" as benchmark we expected a larger error in the data because we noticed that some respondents reported no land when possessing only house land, while others reported positive landholdings.

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[20] 20x20 Dur= 20 Khatta= 1 Bigha= 0.6773 Hectare, Statistical Pocket Book 2002, CBS, Katmandu, Nepal

3. Repeated loans: Whenever a borrower reported that he had previously borrowed from the current lender we recorded repeated lending.

4. Remittance: If a borrower owed cattle or had sources of income other than farm work above or equal to NR 1000 a month, this is recorded as remittance. Farm work in Punjab and permanent labour work were typical examples of this. The data on herds are not very good.

5. Paper: Whenever a contract was signed as a proof of the credit relationship is was registered.

4.3 Categorization of loans

In order to determine default rates on informal loans in the sample villages we have to divide data into different categories. We find it natural to classify loans as potential defaults, as defaults on contracts, or as recent and unclassifiable loans. Important determinants, of which category that each loan falls in, are age of the loan and the amount repaid. After all loans have been categorized we choose one loans to represent each household. Households with more than one informal loan we choose the loan that fall in the lowest category and hence, are most likely to be a default.

All individual loans can be put in one of the seven categories that we define in table 4.2, below. We make two crucial assumptions: (1) Loans less than NR 1000 are considered unclassifiable. Loans less than NR 1000 are usually short term shop credit or advance payments on wages. We assume that households that have borrowed less than NR 1000 are not indebted and hence there is no risk of default on these loans. (2) The opportunity cost of funds is assumed to be 25 percent per year. This is higher than the marginal cost of funds which was 18 percent on loans from the ADB bank at the time of research. We assume that in these less developed regions with relatively cheap and readily available labour capital the expected return from investing money in businesses other than lending will yield a high return. In a study of money lending in Pakistan, the researcher calculated the opportunity cost of funds and found that this was on average 23 percent per year (see Aleem, 1993). 25 percent is assumed to be the opportunity cost of funds in this thesis. The inflation rate in Nepal at the time was less than five percent (Central Bureau of Statistics, Kathmandu, Nepal 2002).

We assume that lenders that asked for less than 25 percent interest rate where either altruistic, or there are other indirect payments included in the deal that cover the expected loss from this contract. According to the categories that we use we are unable to classify these loans.

Tab.4.2 Definition of repayment categorize

Category	Definition (t = the age of the loan and "paid" stands for any interest payments)	Comment
1	$t \geq 3$ and nothing paid	Loss
2	$1 < t < 3$ and nothing paid	Loss
3	$t > 1$ and paid<25 percent	Loss
4	Independent of time category, but 25 percent $\leq$ paid $\leq$ reported interest rate	Default on contract, but no loss
5	$0 < t < \infty$ and reported interest rate ≤ 25 percent	Initially a loss contract
6	$t \leq 1$ and paid < 25 percent	Recent loans[21]
7	No informal loans or loans< NR 1000	Unclassifiable

Category 1 includes loans that are three or more years old and where no interest payments have been made. These loans are considered potential losses to the lender.

Category 2 is also a loss category which includes loans that are taken more than one year ago, but less than three years ago and where no interest rates or principal have been paid.

Category 3 includes loans that are older than one year, and where some interest payments have been made. However, the calculated interest rate paid is less than 25 percent per year. According to the assumption that 25 percent is the opportunity cost of funds, the low interest rate actually paid initiates a loss for the lender.

Category 4 includes loans where calculated interest payments are above 25 percent per year, but less than the reported interest rate.[22] These loans are no loss for the lender, but are defaults on the loan contracts. This category is independent of the age of the loan.

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[21] Category 6 includes recent loans. We are not able to classify recent loans unless they are repeated. Repeated loans are considered safe because a previous repaid loan signal that the borrower is a safe borrowers. Recent not repeated loans are taken out of the sample in the classification in chapter 5.

[22] Calculated interest rates paid: Sometimes the borrower does not know of the exact interest rate he has paid to the lender, but can report a sum that is repaid. In these cases we use this information and calculate the

Category 5 includes loans where the reported interest rate is less than 25 percent. These loans are according to the assumption about the opportunity cost of funds, assumed to be initial loss contracts and we are not able to classify these loans.

Category 6 includes loans that are taken within the last year and where interest rates below 25 percent are already paid.

Category 7 is a sum category where households with no informal loan or only informal loans below NR 1000 are recorded.

We choose one loan for each household. If a household has more than one informal loan above NR 1000 we choose the loan that falls in the lowest of the categories, (1-6)[23]. If the respondent has two or more loans in the same category we use the following determinants in the respective order to rank the risk of the loans:

    a) Oldest

    b) Biggest

    c) Highest interest

The argument is that the older the loan, the more likely the loan is to be a default. Secondly, the size of the loan matter because it is likely to affect the incentives to default. The bigger a loan is, the larger is the gain from default. Thirdly, when a borrower fails to pay interest rate we expect the value of the loan to increase. When the interest rate is high, the size of a loan can grow so big that it is unrealistic that a borrower is able to repay the outstanding loan.

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interest rate paid. Calculated interest paid (c) is defined by equation 4.1. Variable list: Interest payment (I), Principal (K), and Time (t), yearly or monthly;

$$c = \frac{I}{K} x \frac{100}{t}$$

When nothing is paid on the loan the calculated interest is zero. Whenever c is above 25 the lender is recoverable enough to cover the opportunity costs of lending. The definition of c is a simple formula that ignores any compounded interests. During the fieldwork we found that compounded interest is usually not added to the value of the loan. It seemed more appropriate to use this kind of simple formula to calculate c. There will also be an inaccuracy due to little detailed information about when any amount was paid. Our method will overestimate the individual's payment.

[23] Loans in category 7 are unclassifiable and will not be evaluated.

5. Empirical Approach

In this chapter we evaluate the hypotheses outlined in chapter 3 empirically. By discussing information asymmetries, cost of entry and repayment rates we conclude whether we find support for any of the three hypotheses about searching costs, monopoly rents and risk premiums or whether any of the three hypotheses are rejected.

After looking at data from Nepal in 5.1 we relate our study to some previous empirical studies of informal interest rate formation in 5.2. Aleem (1993), Hatlebakk (2000) and Raj (1979) have all studied empirical data and made conclusions on how informal lenders set their interest rates. We shall see that our analyses in some ways both confirm and contradict the results reported in the studies mentioned above. Part 5.3 concludes.

5.1 The experience from Nepal

During the fieldwork we focused on getting detailed data on repayment. We examine the repayment data using the methods described in chapter 4. The information we gathered enable us to give a brief discussion of the costs and information asymmetries.

5.1.1 Information asymmetries

In Nepal we found that village lenders only lend to people they refer to as "their people" which means individuals whom they know well. This indicates that village lenders know a potential borrowers risk types and we assume that screening problems for village lenders are largely solved by personalized relationships and interlinkages between markets. We suppose that village lenders do not face any significant screening costs. Both village and market lenders were active in all villages we visited. Market lenders who are not involved in local trade or village activities lack first hand information about potential borrowers' credibility. These lenders solve the screening problem by for example using local middlemen, traditional screening methods or written contracts.[24] Traditional screening methods can be

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[24] The screening process is described in details in Aleem (1993): The typical screening process involved getting information from about a loan applicants credit history from a third person whom know both the loan applicant and the lender. In addition, new loan applicants are usually given a small "test loans" the first time they get credit. Only if this loan is repaid, and the borrower satisfies the lender's requirements the applicant is accepted and can rely on this lender for credit. A screening process usually takes about a year.

time consuming and is a costly way for a market lender to solve information asymmetries. We found that imperfectly informed lenders preferred to use written contracts to overcome information problems and ensure full liability. Enforcing these contracts in court involves a court fee and is costly.

Under the section on market failure in chapter 3 we said that information asymmetries between borrowers and lenders also cause an incentive problem. The village lenders we talked to said that they kept a close eye on their loan customers. However, it is problematical to estimate any cost of these actions based on our data. Since village lenders live close to the borrowers and have multiple relations with them it is difficult to say whether monitoring a loan customer involves extra time and effort.

In one village we found that a less informed market lender used middlemen. This implies that the lenders solve the information asymmetries by using a local and better informed middleman to guarantee for the person that ultimately got the loans. This middleman belongs to the market lender's "Aphno Manche" and is someone that the moneylender knows well and trusts. We can not exclude the possibility that the market lender must monitor the middleman and that this involves some extra costs. If this is the case there is a double incentive problem involved in these credit arrangements where the market lender must monitor the middleman and the middleman must monitor the borrower. Any searching costs involved in making the contract are therefore likely to be shared between the market lender and the middlemen. We cannot reject that there are transaction costs due to "searching" based on our data.

5.1.2 Cost of entry for new lenders

Relatively free entry for market lenders is necessary for a competitive credit market in villages with limited supply of credit within the village. In the discussion above we found that local lenders have an informational advantage of lending to people in their own village, but we argued that market lenders can enter the market quite easily if they have someone in the village that they trust who is willing to act as middleman or have access to other kinds of security. However, market lenders that come from other villages or a nearby market area will face higher lending costs than village lenders. A relatively free entry into the market implies that a village lender can only have limited market power. This indicates that the

model of monopolistic competition is a good description of the credit market in villages that we visited. The interest rate charged will then be marked up above the average lending costs. The magnitude of the mark up depends on entry costs and the competitiveness of the lending business.

In our study we distinguish between two types of lenders: 1) Village lenders 2) Market lenders. Table 2.2 in chapter 2 showed that in 4 out of 5 villages there is no significant difference in interest rate charged by market and village lenders. This indicates that the two types of lenders either compete on price, here interest rates, or cooperate on price. We suppose cooperation on price, despite relatively free entry, is only possible under certain circumstances when, for example, free entry for some reason does not attract enough new lenders or existing lenders have no incentives to increase their share of the market. In chapter 3 we gave an example from a paper on credit rationing by Stiglitz and Weiss (1981), of a situation where two formal lenders may lack the incentives to compete because an attempt to increase they market share would only attract high risk clients. Informal lenders will also lack incentives to compete and maybe constrain supply of credit if it increases the marginal profit of lending by lowering the costs.

Price collusion has been analyzed as tacit collusion in a capacity constrained oligopoly model in Hatlebakk (2000). The model is also tested against NLSS data from Nepal. We discuss Hatlebakk's main conclusions later in this chapter. When the credit market is modelled with price collusion or credit rationing lenders have limited monopoly power and can earn positive profit.

The fact that there are both market and village lenders operating in the same informal market, makes it interesting to draw some parallel to theories that emphasize interactions between informal and formal lending. We can assume that increased competition from market lenders can have a similar effect, as increased supply formal credit, on the interest rate in a village. The monopolistic competitive model in Hoff and Stiglitz (1997) predicts higher informal interest rates as a result of increased formal credit supply. In our example we could argue that more competition from market lenders give a borrower more choices and adversely affects the repayment incentives and thereby increases a village lender's lending costs. We can use the same arguments as in part 3.2. This means that interest rates that we observe can be both higher and lower as a result of increased competition.

Our data indicate that there is relatively free entry of lenders in the market. But because we are no able to eliminate the possibility that the supply of credit in a village is constrained we cannot reject the monopoly hypothesis either.

5.1.3 Repayment rate on informal loans

Out of the 114 respondents in the 5 sample villages 47 had informal loans with high interest rates that were possible to classify using the method described in chapter 4. The result of the categorisation is presented in the table 5.1 below. The table show the result with respect to each village to ensure that the validity of the data is kept.

Tab.5.1 Classification of loans according to default

Category	Banigama1	Dhuski2	Parsurampur2	Takuwa1	Takuwa3	Total
1	0	0	3	1	2	6
2	0	2	2	3	4	11
3	0	1	0	0	0	1
4	2	2	0	3	1	8
5	1	0	1	4	0	6
6	4	1	3	3	4	15
Total*	7(11)	6(9)	9(16)	14(20)	11(13)	47(69)

*The number in brackets is the number of respondents with informal loans above NR 1000 in each sample.

Source: Survey data

The six categories that we apply in table 5.1 were defined in chapter 4. We recall that categories one to three are considered loss categories. These loans are defaults on contracts because less than 25 percent interest rate and no principal have been paid to the lender, one or more years after it is obtained. With reported interest rates up to 120 percent as tabled in chapter 2 the value of a loan will increase significantly when interest payments are not paid. The loans in category 1 are the oldest loan contracts that are defaulted on. We consider the possibility for repayment less the older a loan becomes. Table 5.1 shows that 18 out of 69 fall in one of three loss categories. These households have informal loans above NR 1000, but have paid repaid little or nothing. We consider these loans potential defaults. In one, more developed village, Banigama, there are no loans in the first three categories and hence

no reported defaults. Table 5.2 presents the percentages of the households with informal loan contracts above NR 1000 that are potential defaulted.[25]

Tab.5.2 Percentage of households with loans that are potential defaults

| Category	Banigama1	Dhuski 2	Parsurampur2	Takuwa 1	Takuwa 3	
1	0	0	19%	5%	15%	
2	0	22%	13%	15%	31%	
3	0	11%	0	0	0	
Total	0	33%	32%	25%	46%	

Source: Survey data

Table 5.2 gives us an indicator to what extent there are enforcement problems in the villages. The enforcement problems in the sample villages seem to be much bigger than the problem projected in the national survey. The NLSS data show that only close to 7 percent of the loans are overdue by at least one year.[26] Since the sample villages are chosen on purpose of low wages and high interest rates, we could expect higher default rates in these villages. However, we see that in Takuwa 3, as many as 46 percent of the households have loan contracts that are difficult to enforce. The percentage in three other villages also appears to be very high. The Lender's Risk Hypothesis and other cost pricing theories predict high informal interest rates in villages where default rates are high. Figure 5.1, below, show the relationship between informal interest rates and default rates in the five villages we visited. The values for mean interest rates are the same as presented in table 2.1.

In the figure one plot represents one village. The figure shows a clear tendency that the default rates affect informal interest rates in villages in Nepal. This suggests that risk premiums are an important explanatory factor of interest rate formations.

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[25] Since we chose one loan from each household, the default rates do not represent a share of credit defaulted on, but rather the share of households that have at least one present loan contract that they default on. This assumption may affect the quality of the results.

[26] The NLSS data include data on "when to repay the loan" and we can tabulate the loans that are overdue. See appendix C for more details.

Fig.5.1 Default rates versus interest rates
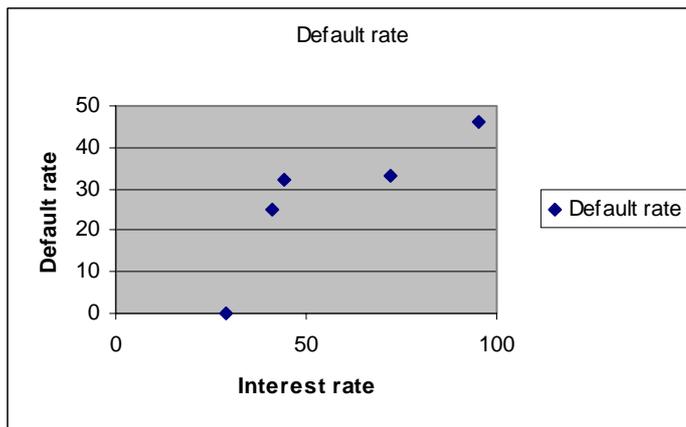
Source: Survey data

We assume competition between moneylenders and use the same numbers as used in figure 5.1 to show the predicted interest rates from a pure risk premium model such as the Lender's Risk Hypothesis represented by equation 3.1. We show how well the interest rates in the sample villages correspond to default rates, *d*. We assume that 25 percent is the opportunity cost of funds, *r*. This is in line with the assumptions made in chapter 4. We use the following equation to calculate the predicted interest rates, *i**.

$$i* = \frac{(1+r)}{(1-d)} - 1 \qquad\qquad\qquad \text{eq.5.1}$$

Tab.5.3 Interest rates predicted by the Lender's Risk Hypothesis

Village	Mean interest rate	Default rate	Interest rate predicted (Predicted 1)
Banigama 1	29	0	25
Dhuski 2	72	33	87
Parsurampur 2	44	32	84
Takuwa 1	41	25	67
Takuwa 3	95	46	131

Source: Survey data

Table 5.3 shows that the high default rate we found in the 5 village predict even higher interest rates than we observe in 4 out of the 5 villages. It appears that lenders in these villages have negative profit and loose money on the lending business. Why are lenders still in the business if it is not profitable? And why do the lenders not increase interest rates further. It can be that lenders informal lenders are generally altruistic, but then why do they not charge zero interest if they do not expect to get the money back anyway? Another explanation is that the high default rates that we have found are illusionary. Loans that were not repaid at the time of the research might be recovered sometime in the future. We evaluate security on informal loans in the next section to see whether some loans are liable in the future. Lenders confirm some default, but do not report that default is a big problem in the business. Most of the stories of default that we heard were about people that had run away from the village. We got the impression that even an old loan that is not repaid is not forgotten, and that the lender will claim it back whenever he finds an opportunity.

5.1.4 Evaluation of security

In the survey we registered a number of different types of security. We also recorded types of security available for each loan contract. We use these detailed data to evaluate liability to judge the likelihood that loans that we identified as potential defaults above, will be repaid in the future. A basic idea is that if security shall give full liability the borrower must own some kind of assets and the lender must have the power or the right to confiscate these assets in case of default on loan contracts. We suppose that village lenders are powerful individuals in the local community that can punish borrowers that default on loans by giving them a bad reputation in the village. Bad reputation can be stigmatising and make it difficult to get loans or shop credit from anyone else in the villages. We assume that market lenders have less influence on individuals' reputation in a village. Below we present the rules of evaluating security on the default cases from the sample.

Remittance

"Remittance" means a borrower have a substantial alternative income, or wealth, that can be used to repay any outstanding debt. However, remittance does not ensure any loyalty and does no prevent strategic default. Because village lenders have more influence in a village we assume that remittance gives full liability for village lenders, but no liability for a market lender. To justify this decision we think of remittance like cash, which we think can easily

be hidden from a market lender. Remittance in combination with a written contract gives full liability for any lender.

Land and gold

The fact that borrowers possess land does not necessarily ensure that a lender can claim the ownership of the land in case of default (Siamwalla et. al, 1993). We also gave examples of some conditions under which collateral might fail to give any lender full liability in chapter three. However, we met people in Nepal who had lost land to moneylenders, which indicate that the threat of loosing land gives incentive to repay a loan whenever it is possible. The borrowers are prepared to loose land if they fail to repay a loan. Possession of land or gold therefore gives the lender full liability. In the data, only households with agricultural land in addition to house land are registered with land. Gold deposits are easier to confiscate and is more efficient as collateral. However, gold as security on informal loans is rare in Nepal.

Interlinkage

If the lender and the borrower have some other relationship prior to, or during the loan period it is possible for the lender to get more accurate information about a borrower's credibility and such close relationships also improves the lenders possibility to enforce repayment. Thus, these loans are relatively safe with respect to strategic defaults, but there is no guarantee for the lender in case of involuntary default. Actually interlinkage loans are more likely to be altruistic, compared to other loans, because the lender feels some responsibility for his customers. A classical study of economic relations, within an Indian caste system, confirms this and suggests that people might have incentives to help lower caste members of the community to buy themselves a good fortune (S. Epstein, 1971). Interlinkages probably also reduce the risk of lending because a lender is always able to recover at least parts of a loan. Interlinkages give limited liability. Most "village-lender loans" are expected to be interlinked.

Repeated credit relations

That a specific borrower has previously repaid a loan to the present lender tells us that the borrower has a good credit history and has not used moral hazard in the past. Repeated loan relations are a signal of honesty and low risk. Depending on the difficulties of building creditability with a new lender, this prevents defaults. As long as the cost of repaying is less than the cost of default, the borrower will have incentives to repay (Besley and Coate,

1995). Repeated loans are considered safe, but the lender is not protected against involuntary default. We assume that repeated loans give limited liability.

Written contract

A written contract ensures that the lender has the legal right to claim the principal plus a certain level of interest from the borrower. This kind of liability works well as a threat of punishment and thereby prevents strategic defaults. In cases where the borrower's situation is unfortunate the system gives the lenders mixed incentives concerning of bringing the case to court because the cost might be higher than the gain. The lenders report that the use of contract is common when lending to people they do not fully trust. We suggest that when a written contract is combined with landholdings, personal guarantee or remittance, the contract gives the lender perfect enforcement power, and full liability. A written contract combined with other kinds of security give less than perfect enforcement power. A contract alone gives the lender a right to enforce a contract, but not necessarily the incentives to do so. A contract alone is therefore likely to only give limited liability. The relatively low number of court cases that involves money lending suggest that there is a small probability for a borrower to be taken to court (See Box 2.1).

A numerical example presented in Box 5.1, below, can also illustrate that lenders might not have the incentive to enforce the contract, but rather keep a written contract as a threat.

Box 5.1 A numerical example of a written contract

Assume a lender lends the amount NR 1000 to a borrower at 50 percent interest rate per year. To secure the repayment he makes the borrower sign a contract of 3 times the original loan sum, but at the legal interest rate of 10 percent. This example is similar to the cases we described in chapter 2.

The value of the contract and the value of the loan will be different in each period.

Period	Value of the loan in NR	Value of the contract in NR
1	1500	3300
2	2250	3360
3	3375	3696
4	5063	4066

The table show that in the first 3 years after the loan has been issued the value of the contract exceeds the value of the loans. From the 4 year the value of the loan exceeds the value of the contract.

This example shows that the lender loose profit, when forcing the contract after 3 years. It is therefore possible that lenders keep the contract as a treat, but have no intention of going to court.

The discussion above facilitates the evaluation of the liability in the 18 loss cases found in the categorization of loans. We use three levels of liability: Full liability (FL), limited liability (LL) and no liability (NL).[27] Out of the 18 loans that appear to be losses we registered some form of security on 15 of the loans. Those loans where no security is registered are characterised by NL. The kind of security that we registered for each of the observations that fell in the categories 1 to 3 is summarized in table 5.4 below.[28]

Tab.5.4 Evaluation of security on all the loans that are default

Village	Category	Lender	Remit-tance	Land/ Gold	Repeated	Paper	Inter-Linkage	Evalua-tion
Duskhi2	2	M	1	1	0	1	0	FL
Duskhi2	2	V	0	0	0	0	0	NL
Duskhi2	3	V	0	1	1	0	1	FL
Parsurampur2	1	V	0	0	0	0	0	NL
Parsurampur2	1	V	0	1	0	0	0	FL
Parsurampur2	1	V	1	1	0	0	0	FL
Parsurampur2	2	V	1	0	1	0	0	FL
Parsurampur2	2	M	1	1	1	0	1	FL
Tajuwa1	1	V	0	0	1	1	0	LL
Takuwa1	2	M	1	1	0	0	0	FL
Takuwa1	2	V	1	0	0	0	1	FL
Takuwa1	2	V	0	1	1	0	0	FL
Takuwa3	1	M	0	1	0	1	0	FL
Takuwa3	2	M	1	0	0	1	0	FL
Takuwa3	2	M	0	0	0	0	0	NL
Takuwa3	2	M	0	0	1	1	0	LL
Takuwa3	2	M	1	0	1	1	0	FL
Taruma3	1	V	0	0	1	0	0	LL

Source: Survey data

12 of the 18 default cases are considered completely safe, even when defaulted on for two or more year. This is possible because a loan can be repaid in cash or in assets years after it has been given. We see that only 3 loans fall in the category of no liability loans where the

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[27] It should be made clear that there is no definitive answers to this discussion, and that the evaluation is of a rather subjective character.

[28] Notice that the list of securities is not necessarily complete. Personal guarantee, for example from middlemen as we registered in one village, is not systematically registered in the rest of the survey.

lenders seem to have no chance to reclaim the loan back in the future. In 3 cases we assume that the liability is limited and that the lenders may be able to recover the loan fully or partly. By coincidence these loans are all repeated. However, any interlinked loan contracts that are not secured in other ways would also fall into this category. The low number of loans that are parts of interlinked contracts where repayments are a problem, suggest that interlinkages are an effective way to secure loans. We can see from the table above that primarily market lenders use written contracts as security.

Tab.5.5 Share of no liability-default and limited liability loans in 5 villages

Village	% NL loans	% LL loans	% NL+LL loans
Banigama1	0%	0%	0%
Duskhi2	11%	0%	11%
Parsurampur2	6%	0%	6%
Takuwa1	0%	5%	5%
Takuwa3	8%	15%	23%

Source: Survey data

In table 5.5 we present default rates for each village after considering the likelihood of the loan being enforced in the future. In table 5.5 we include loans that, according to our evaluation, are no liability loans and limited liability loans. The actual default rates or loss rates in a village will probably lie between the percentage of NL loans and the percentage of NL plus LL loans. In the four villages with some potential defaults, we find that likely default rates vary from five to possibly 23 percent. Looking at the certain defaults, the rates vary from five percent to 11 percent.

Figure 5.2 show an almost linear relationship between interest rates and default rates (including both NL and LL loans). Any linear relationship considering only NL loans as defaults is less clear. This figure is based on very few observations and it seems rather desperate to draw any further conclusions based on this result. After evaluation of security, the default rate is reduced in all villages with an initial positive default rate. The default rates in Dhuski and Takuwa 3 have decreased the most and are both less than half the initial default rates.

Fig.5.2 Informal interest rate versus default rate in five villages
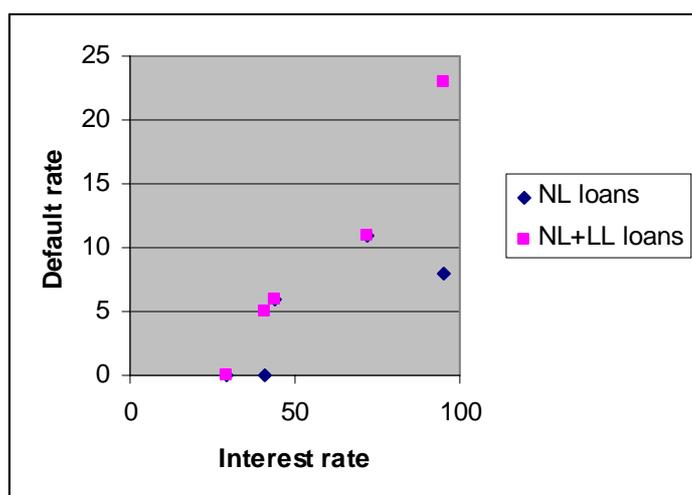
Note: Each village is represented by a value of interest rate and have two corresponding levels of default. For interest rate values with only one dot the default rate in the two series are the same.

Source: Survey data

Table 5.6, below, show the predictions of the Lender's Risk Hypothesis after considering that some loans might be enforced in the future. In all the villages we observe an interest gap that cannot be explained by a risk premium.

Tab.5.6 Interest rate predicted by the Lender's Risk Hypothesis after the evaluation of security

Village	Mean interest rate	Predicted NL	Predicted NL+LL
Banigama 1	29	25	25
Dhuski 2	72	40	40
Parsurampur 2	44	33	33
Takuwa 1	41	25	33
Takuwa 3	95	36	62

Source: Survey data

Figure 5.3, below, gives a good presentation of interest rate gaps observed in the five sample villages in Nepal. The first column, for each village, represents the average interest rates that we observed. The three following columns represent three different predicted interest rates. Predicted interest rates are in all villages at least 25 percent, which we assumed to be a lender's opportunity cost of funds. In all the villages with potential defaults, we see that the predicted interest rate before evaluating liability (Predicted 1) initiate a loss

for a lender. In the diagram this is observed by the second column rising higher than the first column. It is interesting to observe that a ranking of villages with respect to average sample interest rates, gives the same order as ranking villages with respect to both "Predicted 1" and "Predicted NL+LL". We are therefore not convinced that there is no relationship between risk and interest rates. However, the diagram shows that risk premiums cannot explain the entire interest gap observed in informal markets.

Fig.5.3 Interest rate gaps in each village
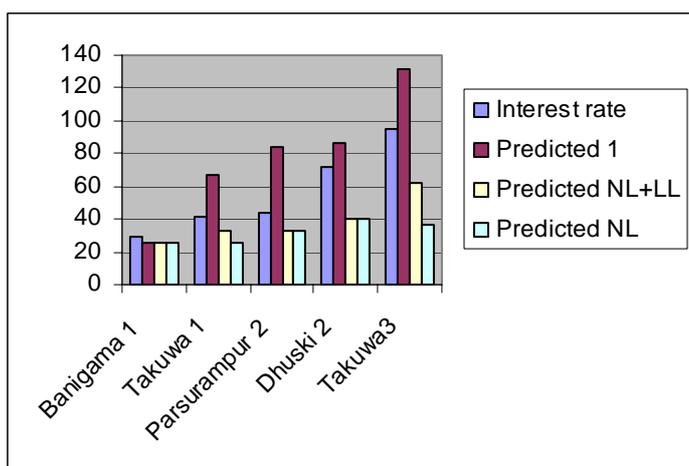
Source: Survey data

In this repayment analysis we considered all loans that fell in the categories one to three as potential losses. We see that a large share of these loans is likely to be enforced by the lender because there is some kind of security. In this part we found that market lenders have access to kinds of security that give full liability even though they lack local lender's enforcement power. There are probably costs involved in enforcing security. Based on our study, however, we are not able to calculate these costs. Nevertheless, we know that enforcement of legal contracts involves a fee to the court, and we know that it involves time and effort to visit borrowers repeatedly to ask for repayment or to claim their land. A more detail study of lending costs is found in Aleem (1990). We will present that study in details in a later section.

Based solely on analysis of the survey data, we are not able to reject any of the three hypotheses, even though we argue that the default rates after evaluating security are relatively low- there seems to be a small risk premium that can explain some of the interest

rates. However, we look at conclusions made from other empirical studies to discriminate between high searching costs and monopoly rent due to capacity constraints.

5.2 Relevant previous empirical studies

In a recent paper Hatlebakk (2000) is testing a model a cost-pricing monopolistic competitive model with asymmetric information on the NLSS data set from Nepal. Hatlebakk assumes that interest rate depends on risk related variables like caste, land value and loan size and argues that the data show no significant effect of these variables on the interest rate. Based on these conclusions he finds little support for the model and concludes that the high interest rates in Nepal are not due to lending costs.

If lending costs determine the interest rate, we should be able to identify variables that determine costs, and thus interest rates. The risk-premium hypothesis implies that interest rates increase in the lender's cost of default. The cost of default is in turn likely to be smaller the higher is the borrowers' wealth, as measured by land value. Similarly, the cost of default is likely to increase in the loans size. On the other hand, the average screening costs are likely to be smaller the larger the loan. The total effect might be a U-shaped relation as modelled by Bell (1990). However, adjusting for indignity, we find no significant effect of loan size on the equilibrium interest rates. Furthermore, we find no significant effect of land value on the interest rates. [29]

The conclusions above are based on assumptions made on how land value and loan size affect risk. If there is no relationship between default and the risk related factors like land and loan size, or land is not efficient to ensure full liability Hatlebakk's study could possibly overlooks a risk premium in the market. Our data confirms a low risk premium, but our survey data shows a strong tendency toward higher interest rates in villages with relatively higher rates defaults. Our result shows that there are potentially high costs in chasing delinquent loans and enforcing security. This is not captured in Hatlebakk's testing.

In the same paper Hatlebakk is also testing a model of a collusive oligopoly with full information on the NLSS data from Nepal. This model gives predictions about how interest rates are set in different segments of a village. We already introduced this theory briefly in

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[29] "Will more credit increase the interest rates in rural Nepal?" M. Hatlebakk (2000), pp.19

chapter 3. The model used in Hatlebakk (2000) predicts that interest rates in villages with low lending capacities are determined by the borrowers' demand for credit in the village. This implies that in villages with low lending capacity the interest rates will be high. This result is only valid if default rates are low and costs related to defaults are low. Again, our village sample confirms low default rates, but not necessary low costs due to reduction of risk. For villages with higher lending capacities, the model predicts that high interest rates may be a certain interval of lending capacities where high interest rates are a result of collusive monopoly pricing. In both cases the lenders might earn profit. For villages without lending constraints, the market will be competitive with zero profit. Based on the test of this model against data from Nepal, Hatlebakk is not able to identify a capacity-interval that shows a significantly increasing price function. He is thus not able to distinguish between a competitive and a collusive price setting in villages with higher lending capacity. However, because he finds limited support in the first test of a cost pricing model of informal interest rates formation, he concludes that his study give more support to the model of capacity constrained lending with possible collusive pricing of interest rates. An important contribution of this paper is to determine the lending capacities for villages in Nepal. He uses land value above a certain critical value as an indicator of individual lending capacities. The study concludes that most villages are capacity constrained. According to this result we should expect that most of the high interest/low caste villages we chose to have in our sample are capacity constrained. We mentioned in the analysis that in Takuwa 3 there was few local lenders. In this particular village we observed the highest average interest rate. In all the villages we observed both local and external lenders. This implies that credit is constrained within a village, since borrowers always look for local sources of credit before they turned to market lenders. In another village, Banigama, which is more developed than the other villages we have in the sample, we observed lower interest rates. This village is most likely not capacity constrained and as the model used by Hatlebakk predicts, the interest rates in this village may reflect full competition.

Hatlebakk's study is interesting because it shows that actual interest rates in capacity constrained villages need not systematically correspond to the predicted interest based on default and lending costs, but rather depends on the supply of credit. Variations in interest rates between villages in our sample can therefore be explained by differences in supply of credit.

Hatlebakk's conclusions contradict the results from a study of lending cost in the informal credit market conducted by I. Aleem (1993). The latter is a detailed study of the lending activity of 14 moneylenders operating around Chamber in the Sind region in Pakistan.[30] An important contribution by Aleem, is to provide data which show that average costs of lending exceed marginal costs of lending. This difference is explained by high screening costs. Further, his study shows that the calculated average costs of lending largely correspond to the interest rates charged by informal lenders. Variations found in average costs are similar to the variations found in informal interest rates. Aleem suggests that the informal credit market is best described by a monopolistic competitive market model with relatively free entry of new lenders. When Aleem distinguishes between lending as a primary activity and lending as a joint activity, carried out in parallel to other trading activities, his conclusions becomes more ambiguous. For primary lenders the results still support the average cost pricing theory, but for joint lenders the data show an interest gap between average cost reported and interest rate charged. The lenders usually did not entertain loan requests from farmers that they had no previous dealings with. Hence, most lenders are joint lenders. Some results from Aleem's study are summarized in table 5.7, below.[31]

Tab.5.7 Some results from Aleem (1993)

Item	Marginal cost	Average cost		Interest rate
		Lending the primary activity	Lending a joint activity	
Mean	48.09	79.20	67.94	78.65
Standard deviation	14.58	40.75	40.52	38.14

Source: Aleem (1993)

The absence of random sampling of lenders in the Chamber region limits the further discussion of the interest rate gap observed for joint lenders. One possibility that Aleem suggests is that a group of joint lenders with high lending costs could be missing in the sample.

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[30] An important remark is that Aleem interviewed only market lenders, whereas in our study we distinguish between market and village lenders.
[31] Aleem,(1993), page 148: See table 7-8 further references

The average costs include estimates of the screening activity, opportunity cost of funding, value of time spent chasing delinquent loans and so on. The estimation includes a valuation of the lender's time. This is a complicated issue, because if lending is a joint activity, it is difficult for the lender to report the amount of time spent on which business if the businesses are interlinked. Crucial to the result is also the assumption that the opportunity cost of funds equals the marginal cost of funds, on average 23 percent for the 14 lenders, rather than the prevailing bank rate of 10 percent. In our data analysis we assumed that the opportunity cost of funds equals 25 percent, which is higher than the bank rate at 18 percent for loans in the ADB bank at the time of research. Without these assumptions the interest rate gaps observed in both studies would be larger.

Aleem's study also describes a typical screening and monitoring process in details. He finds that lenders must invest a substantial amount of time, resources and efforts in evaluating a borrower's credibility. Lenders typically issue small test loans to first-time borrowers. Aleem concludes that the screening process is costly for these market lenders and that these costs reflect the interest rates that these lenders charge on informal loans. However, we have no data to conduct similar calculations.

A main task in this data analysis has been to determine the default rate on informal loans in Nepal. Aleem also investigate the repayment of informal loans as a part of his study of lending costs in Pakistan. The average default rate for the 14 lenders is 2.7 percent. New lenders face a higher rate of default than more well-established lenders in the survey. Aleem concludes that default and interest lost due to delinquent loans only count for a relatively small part of the total interest charges. The default rate on small "test loans", offered in the screening period, is higher. This results in a high rejection rate on new loan applicants. Test loans are used by most of the lenders to lower the risk of bad debt.[32] Moneylenders report a higher share of delinquency. All 14 reported a problem of late repayment. On average 15 percent of the loans were likely to be delayed. The lenders face a higher risk of default on these loans, and there are interest loss and costs of chasing overdue loans. 5 out of 14 lenders say they do not charge extra interest for late repayment. The rest only accept such losses under specific circumstances.[33] Very few loans were secured with collateral, but 78 percent of the customers were repeated costumers.

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[32] Aleem gives a longer intuitive explanation to how test loans lower risk. See page 145, Aleem (1993)
[33] See Table 7-3, Aleem (1993) for details.

Our study shows little evidence of expensive screening, but we find that there are large enforcement problems. Aleem found that the costs related to enforcement problems could only count for a small share of the interest rates. We are not able to calculate these costs based on out data. However, if this result from Aleem applies to Nepal it implies that lending costs in Nepal are relatively lower than those observed in Pakistan due to low screening costs.

Few studies we know about have been made on repayment. Raj (1979) published a paper where he is reflecting on the applicability of Keynesian economic theory on the agrarian economies in developing countries. One topic that he discusses is default and mark up on informal loans. Raj argues different perspectives and explanations of high interest rates. In his paper he discusses the data from an "All Indian Rural Credit survey". In this survey two-thirds of the moneylenders say that they consider less than 10 percent of the loans as doubtful. Raj concludes that the Lender's Risk Hypothesis based on U Tun Wai (1957) cannot alone explain the high interest rates charged on informal loans.[34] This conclusion is similar to our conclusion based on our observations on default. Raj suggests we look in the direction of credit rationing to explain high informal interest rates. We described briefly a theory of credit rationing in the theoretical approach. In theory, interest rates can reflect both costs and monopoly rent when there is credit rationing. This gives some similar implications as the capacity constrained model- that we do not necessary observe any systematic relationship between predicted interest rates based on default and the observed interest rates.

5.3 Preliminary conclusions

Based solely on our experience from Nepal we are no able to reject any of the three hypotheses about interest rate formation. We summarize outcomes of the analysis below.

An estimate of potential risk represented by default rates before evaluating the liability of any loans, show that there are large enforcement problems in four out of five villages in our sample. We find that the predicted interest rate based on the potential risk projected negative profit in four villages. This implied that these initial default rates were illusionary.

---

[34] Conversely, Raj says nothing about the default rate that the rest, 1/3, of the lenders report.

After considering the liability of each loss contract we found significantly lower default rates, but we still observe a tendency of higher interest rates in villages with relatively high default rates. However, in line with Raj we conclude that the interest rate gaps that we observe between informal and formal interest rates in Nepal cannot alone be explained by risk premiums.

Another observation that was emphasized during the analysis was that we observed no significant difference between the interest rates charged by village lenders and market lenders in four out of five villages. We argued that this can indicate both competition and price collusion.

We observe a dual informal credit market where both village and external market lenders provide credit in each village. Market lenders seem to be a part of a "semiformal" credit market, where written contracts ensure legal enforcement. That market lenders have access to kinds of security that ensure full liability make them able to compete with local lenders at village level. We found in line with Aleem that there is relatively free entry into the market. This implies that there is some competition in the market.

Aleem finds that screening costs are high, but our experience is that even less informed market lenders are able to overcome the screening problem without large investments because they also have access to efficient ways to secure loans. However, our data indicated that there are large enforcement problems and possibly costs due to chasing overdue loans for both types of lenders. This implied that we cannot reject the possibility of high transaction costs due to expensive searching activities.

The relatively free entry for new lenders and the high enforcement costs gave strong indicators of a monopolistic competitive modelling of the informal credit market. However, a previous study of the informal credit market in Nepal concludes that high interest rates in Nepal do not reflect high lending costs (Hatlebakk, 2000). This conclusion relies on several assumptions about risk. We argued in the analysis that the study possibly overlooks any risk premiums and enforcement costs.

In the same study Hatlebakk (2000) shows that rural villages in Nepal are capacity constrained. In these villages the informal interest rates do not have to reflect cost of lending

and default. Interest rates can rather be determined by the demand for credit in these villages and lenders can earn positive profit and monopoly rent. We suggest that in villages with relatively high risk of default there can be credit constrains because lenders lack incentives to compete and hence ration credit. Credit rationing models originally explain interest rates below equilibrium level, but in a competitive aspect the model can also explain high interest rates. In villages that are more developed the risk of default seems to be lower. In these villages there are no credit constraints and the informal credit market is likely to be competitive.

6. Conclusions

The data survey show that the average annual interest rates on informal loans vary from 29 percent to 95 percent. At the time of the research the Agricultural Development Bank providing loans in the same area charged an interest rate of 18 percent per year. The observed interest rate gaps between formal and informal interest rates are confirmed by data from a national household survey from 1996.

In theory there exist competing perspectives of the informal credit market. Based on a selection of theoretical contributions we conclude that high informal interest rates are either due to high costs or monopoly rent. We distinguish three elements that affect the level of interest rates that we observe in the informal market. These are the basis for the three hypotheses about interest rate formation: The risk premium hypothesis, the searching cost hypotheses and the monopoly rent hypothesis.

An empirical evaluation of the hypotheses finds that based solely on the data survey from Nepal we are not able to reject any of the three possible explanations of high interest rates. We identify positive, but low default rates in four of the five sample villages. This implies that the risk premiums charged on informal loans are low. The high potential default rates indicate that informal lending is risky, and we suggest that there are high enforcement costs either due to chasing delinquent loans or due to cost of enforcing security. A main task in this part of the analysis was to present rules for evaluating liability on overdue loans.

Further, we learned from the experience of Nepal that screening costs are generally low. For village lenders adverse selection and moral hazard are largely overcome by personal relationships and interlinked contracts. For market lenders these problems are solved by access to security that gives full liability.

We conclude that the informal credit market in Nepal is best described by a monopolistic competitive model with free entry where interest rates reflect transaction costs, mainly due to risk premiums and enforcement costs. However, we argue that there can be credit rationing in villages with relatively high risk of default. Based on the data survey we are not able to discuss this further.

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Appendix A: Questionnaire

Questionnaire, 2003

Living conditions in the Terai of Nepal

Research conducted by University of Bergen, Norway

District: VDC-ward:

Date: Household head (caste):

Minutes of travel to local market:

Minutes of travel to main market (include name):

Facilities in the village:

Electricity: Bus-service:

1

2

3

4

Appendix B: Survey data results

Stata commands: Chapter 2

```
use "\\\cmifile01\norunnh$\Feltarbeid\Databehandlin\felt
org.filer\syrveydata03.dta", clear
sort village
by village tab lender
sort loansize
drop if loansize<1000
drop lender
gen lender=typeofle=="m"
sort village
by village: sum reported loansize
sort village lender
by village lender: sum reported loansize
by village: reg reported lender loansize
tab lender security
tab lender nosecuri
tab lender lackin
do "C:\DOCUME~1\norunnh\LOCALS~1\Temp\STD000000.tmp"
```

The number of respondents and the number of lenders in each village
The number of respondents includes respondents with no informal loans above NR1000.
The bold numbers are the number of lenders in the village.

Banigama1

Lender	Freq.	Percent	Cum.
0	15	78.95	78.95
1	**4**	21.05	100.00
Total	19	100.00	

Dhuski2

Lender	Freq.	Percent	Cum.
0	10	83.33	83.33
1	**2**	16.67	100.00
Total	12	100.00	

Parsurampur2

Lender	Freq.	Percent	Cum.
0	23	100.00	100.00
Total	23	100.00	

Takuwa1

Lender	Freq.	Percent	Cum.
0	34	85.00	85.00
1	**6**	15.00	100.00
Total	40	100.00	

Takuwa3

```
    Lender |      Freq.      Percent        Cum.
-----------+-----------------------------------
         0 |         19        95.00       95.00
         1 |          1         5.00      100.00
-----------+-----------------------------------
     Total |         20       100.00
```

The average interest rate and the average loansize for each village

Banigama1

```
Variable |     Obs        Mean    Std. Dev.        Min         Max
---------+------------------------------------------------------
reported |      11    29.45455     16.42172          0          48
loansize |      11    23272.73     29502.85       2000      100000
    land |       0
```

Dhuski2

```
Variable |     Obs        Mean    Std. Dev.        Min         Max
---------+------------------------------------------------------
reported |       9          72     26.15339         36         120
loansize |       9    10388.89     11815.71       1500       40000
    land |       0
```

Parsurampur2

```
Variable |     Obs        Mean    Std. Dev.        Min         Max
---------+------------------------------------------------------
reported |      14    43.92857     10.73789         25          60
loansize |      16     14937.5     14912.94       1500       50000
    land |       0
```

Takuwa1

```
Variable |     Obs        Mean    Std. Dev.        Min         Max
---------+------------------------------------------------------
reported |      20       41.05     25.38229          0         120
loansize |      20      8327.5     11849.73       1000       50000
    land |       0
```

Takuwa3

```
Variable |     Obs        Mean    Std. Dev.        Min         Max
---------+------------------------------------------------------
reported |      13    95.38462     40.74624          0         120
loansize |      13    2653.846     1448.341       1000        5000
    land |       0
```

The average interest rate dependent on type of lender.
Lender=0 is village lender
Lender=1 is market lender

Banigama1 lender=   0

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+----------------------------------------------------
reported |       7    29.14286    20.61899         0         48
loansize |       7    12285.71    16859.36      2000      50000
```

Banigama1 lender=   1

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+----------------------------------------------------
reported |       4          30    6.928203        24         36
loansize |       4       42500    39475.73     10000     100000
```

Dhuski2 lender=   0

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+----------------------------------------------------
reported |       5        79.2    27.62607        60        120
loansize |       5        5700     5019.96      1500      14000
```

Dhuski2 lender=   1

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+----------------------------------------------------
reported |       4          63    24.73863        36         96
loansize |       4       16250    16007.81      5000      40000
```

Parsurampur2 lender=   0

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+----------------------------------------------------
reported |      11    44.90909    10.47334        25         60
loansize |      12    9666.667    8597.921      1500      30000
```

Parsurampur2 lender=   1

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+----------------------------------------------------
reported |       3    40.33333    13.27906        25         48
loansize |       4       30750    19910.22      3000      50000
```

Takuwa1 lender=   0

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+----------------------------------------------------
reported |      17    41.11765    27.51109         0        120
loansize |      17    8914.706    12813.15      1000      50000
```

Takuwa1 lender=   1

```
Variable |     Obs        Mean    Std. Dev.       Min        Max
---------+----------------------------------------------------
reported |       3    40.66667    8.082904        36         50
loansize |       3        5000        1000      4000       6000
```

```
Takuwa3    lender=          0

Variable |      Obs        Mean    Std. Dev.       Min        Max
---------+-----------------------------------------------------
reported |        4          55    49.32883         0        120
loansize |        4        2550    1725.302      1200       5000


Takuwa3    lender=          1

Variable |      Obs        Mean    Std. Dev.       Min        Max
---------+-----------------------------------------------------
reported |        9    113.3333          20        60        120
loansize |        9        2700    1422.146      1000       5000
```

Regression to see whether interest rates significantly differ dependent on lender.

Banigama1

```
  Source |       SS       df       MS              Number of obs =      11
---------+------------------------------           F(  2,      8) =    0.08
   Model | 49.9232515       2  24.9616258          Prob > F      =  0.9280
Residual | 2646.80402       8  330.850503          R-squared     =  0.0185
---------+------------------------------           Adj R-squared = -0.2269
   Total | 2696.72727      10  269.672727          Root MSE      =  18.189


------------------------------------------------------------------------------
reported |      Coef.   Std. Err.       t    P>|t|     [95% Conf. Interval]
---------+--------------------------------------------------------------------
  lender | -1.764951   13.31595     -0.133   0.898    -32.4716     28.94169
loansize |  .0000868   .0002277      0.381   0.713    -.0004383    .0006119
   _cons | 28.07666    7.42234       3.783   0.005     10.96072    45.19261
------------------------------------------------------------------------------
```

Dhuski2

```
  Source |       SS       df       MS              Number of obs =       9
---------+------------------------------           F(  2,      6) =    1.95
   Model | 2152.62239       2  1076.3112           Prob > F      =  0.2232
Residual | 3319.37761       6  553.229602          R-squared     =  0.3934
---------+------------------------------           Adj R-squared =  0.1912
   Total |    5472.00       8     684.00           Root MSE      =  23.521


------------------------------------------------------------------------------
reported |      Coef.   Std. Err.       t    P>|t|     [95% Conf. Interval]
---------+--------------------------------------------------------------------
  lender | -2.026565   17.88202     -0.113   0.913    -45.7823     41.72917
loansize | -.0013435   .0007976     -1.684   0.143    -.0032952    .0006083
   _cons | 86.85769    11.45936      7.580   0.000     58.81765    114.8977
------------------------------------------------------------------------------
```

Parsurampur2

```
  Source |       SS       df       MS              Number of obs =      14
---------+------------------------------           F(  2,     11) =    0.23
   Model | 59.0370095       2  29.5185047          Prob > F      =  0.8017
Residual | 1439.89156      11  130.899233          R-squared     =  0.0394
---------+------------------------------           Adj R-squared = -0.1353
   Total | 1498.92857      13  115.302198          Root MSE      =  11.441


------------------------------------------------------------------------------
reported |      Coef.   Std. Err.       t    P>|t|     [95% Conf. Interval]
---------+--------------------------------------------------------------------
  lender | -5.770316   8.649917     -0.667   0.518    -24.80865    13.26802
loansize |  .0000803   .0002952      0.272   0.791    -.0005694    .00073
   _cons | 44.15002    4.437126      9.950   0.000     34.38398    53.91607
------------------------------------------------------------------------------
```

Takuwa1

```
  Source |       SS         df        MS              Number of obs =        20
---------+------------------------------              F(  2,   17) =      0.01
   Model |  12.5548182       2   6.27740909           Prob > F     =    0.9913
Residual |  12228.3952      17   719.317364           R-squared    =    0.0010
---------+------------------------------              Adj R-squared = -0.1165
   Total |   12240.95       19   644.260526           Root MSE     =     26.82
```

```
-------------------------------------------------------------------------------
reported |    Coef.    Std. Err.       t     P>|t|      [95% Conf. Interval]
---------+---------------------------------------------------------------------
  lender | -.7158685   16.91977     -0.042   0.967     -36.41346    34.98172
loansize | -.0000677   .0005231     -0.129   0.899     -.0011713    .001036
   _cons |  41.72086   8.003651      5.213   0.000      24.83463    58.60709
-------------------------------------------------------------------------------
```

Takuwa3

```
  Source |       SS         df        MS              Number of obs =        13
---------+------------------------------              F(  2,   10) =      7.00
   Model |  11622.3999       2   5811.19995           Prob > F     =    0.0126
Residual |  8300.67702      10   830.067702           R-squared    =    0.5834
---------+------------------------------              Adj R-squared =   0.5000
   Total |  19923.0769      12   1660.25641           Root MSE     =     28.811
```

```
-------------------------------------------------------------------------------
reported |    Coef.    Std. Err.       t     P>|t|      [95% Conf. Interval]
---------+---------------------------------------------------------------------
  lender |  59.73716   17.33466      3.446   0.006      21.11313    98.36119
loansize | -.0093588   .0057495     -1.628   0.135     -.0221696    .003452
   _cons |  78.86499   20.55412      3.837   0.003      33.06757    124.6624
-------------------------------------------------------------------------------
```

Lenders and security

```
          |        Security
  typlend |        0          1 |     Total
----------+----------------------+----------
        0 |        8         37 |        45
        1 |        3         21 |        24
----------+----------------------+----------
    Total |       11         58 |        69
```

Lenders and no security

```
          |       No security
  typlend |        0          1 |     Total
----------+----------------------+----------
        0 |       40          5 |        45
        1 |       23          1 |        24
----------+----------------------+----------
    Total |       63          6 |        69
```

Lenders and lack information

```
          |        Lack info
  typlend |        0          1 |     Total
----------+----------------------+----------
        0 |       42          3 |        45
        1 |       22          2 |        24
----------+----------------------+----------
    Total |       64          5 |        69
```

Number of written contracts in each village

```
           |         Paper
   Village |       0          1 |     Total
-----------+--------------------+----------
      ban1 |       8          3 |        11
      gus2 |       7          2 |         9
      par2 |      12          4 |        16
        t1 |      17          3 |        20
        t3 |       5          8 |        13
-----------+--------------------+----------
     Total |      49         20 |        69
```

Number of remittance in each village

```
           |       Remittance
   Village |       0          1 |     Total
-----------+--------------------+----------
      ban1 |       2          9 |        11
      gus2 |       3          6 |         9
      par2 |       5         11 |        16
        t1 |       7         13 |        20
        t3 |      10          3 |        13
-----------+--------------------+----------
     Total |      27         42 |        69
```

Number of repeated loans in each village

```
           |        Repeated
   Village |       0          1 |     Total
-----------+--------------------+----------
      ban1 |       6          5 |        11
      gus2 |       6          3 |         9
      par2 |      10          6 |        16
        t1 |       9         11 |        20
        t3 |       6          7 |        13
-----------+--------------------+----------
     Total |      37         32 |        69
```

Number of interlinked contracts in each village

```
           |      Interlinkage
   Village |       0          1 |     Total
-----------+--------------------+----------
      ban1 |       9          2 |        11
      gus2 |       6          3 |         9
      par2 |      13          3 |        16
        t1 |      13          7 |        20
        t3 |      11          2 |        13
-----------+--------------------+----------
     Total |      52         17 |        69
```

Number of loans secured with land or gold in each village

```
           |        Land/gold
   Village |        0          1 |      Total
-----------+---------------------+----------
      ban1 |        7          4 |         11
      gus2 |        3          6 |          9
      par2 |        4         12 |         16
        t1 |       12          8 |         20
        t3 |       12          1 |         13
-----------+---------------------+----------
     Total |       38         31 |         69
```

Number of loans secured in each village

```
           |        Security
   Village |        0          1 |      Total
-----------+---------------------+----------
      ban1 |        3          8 |         11
      gus2 |        2          7 |          9
      par2 |        2         14 |         16
        t1 |        2         18 |         20
        t3 |        2         11 |         13
-----------+---------------------+----------
     Total |       11         58 |         69
```

Stata commands: Chapter 5

```
use "\\\cmifile01\norunnh$\Feltarbeid\Databehandlin\felt
org.filer\syrveydata03.dta", clear

tab category village
drop if loansize<1000
drop if lackinfo==1
drop if category==5 & repeated==0
drop if category==6 & repeated==0
tab category village
sort village
drop if category>3
sort category
by category: list village typeofle reported mortgage landgold nosecuri interlin
repeated security remittan paper lackinfo
tab category security
```

We adjust the data to loans that are classifiable

```
drop if loansize<1000
(45 observations deleted)
drop if lackinfo==1
(5 observations deleted)
drop if category==5 & repeated==0
(7 observations deleted)
drop if category==6 & repeated==0
(10 observations deleted)
drop if category>3
(29 observations deleted)

All results are found in the text.
```

Appendix C: NLSS data results

Stata commands

```
use "\\\cmifile01\norunnh$\NLSS\RT065.DTA", clear
gen S14A3LNO=S14A2LNO
sort wwwhh S14A3LNO
merge wwwhh S14A3LNO using "\\\cmifile01\norunnh$\NLSS\RT066.DTA"
drop _merge
sort wwwhh
merge wwwhh using "\\\cmifile01\norunnh$\NLSS\land.DTA"
drop _merge
sort wwwhh
merge wwwhh using "\\\cmifile01\norunnh$\NLSS\ethnic.DTA"
drop _merge
gen ward=int(wwwhh/100)
sort ward
merge ward using "\\\cmifile01\norunnh$\NLSS\RT090.DTA"
drop _merge
ren S14A2_08 loansize
ren S14A209B interest
ren S14A2_05 lender
save "\\\cmifile01\norunnh$\NLSS\eksempel.dta", replace

drop if loansize<1000
drop if belt==1
drop if belt==2
sum interest loansize [aw=factor]
graph interest S14A206B, ylab(0(5)85)
reg interest loansize
tab lender
tab S14A316A
tab lender if S14A316A==5
tab lender if S14A316A==1
sort lender
by lender: tab interest loansize

gen repsome= amountpa
drop if repsome==.
gen paydelay= whenpay
drop if paydelay==.
tab paydelay
gen diff=(52-paydelay>1)
drop paydelay
tab repdelay

tab S14A3_17
tab S14A3_14 if S14A3_17>52
tab S14A3_15 if S14A3_17>52
```

Average interst rate and loansize in Eastern Terai

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
interest	385	540500.589	**40.35863**	20.30154	0	84
loansize	504	716345.560	**7695.15**	13068.45	1000	150000

Purpose of borrowing in Eastern Terai

| ÄÂÄ	Freq.	Percent	Cum.
Inputs	4	0.93	0.93
Equipmen	1	0.23	1.17
Land	15	3.50	4.67
Animals	36	8.41	13.08
Building	5	1.17	14.25
Other bu	44	10.28	24.53
Consumpt	191	44.63	69.16
Dwelling	17	3.97	73.13
Marriage	57	13.32	86.45
Durables	1	0.23	86.68
Other pe	57	13.32	100.00
Total	428	100.00	

. tab lender

Types of lenders

obtained	Freq.	Percent	Cum.
Relative	1140	42.13	42.13
Agri. De	260	9.61	51.74
Commerci	66	2.44	54.18
Grameen-	30	1.11	55.28
Other fi	51	1.88	57.17
Local gr	3	0.11	57.28
NGO or r	6	0.22	57.50
Landlord	96	3.55	61.05
Shopkeep	134	4.95	66.00
Money le	837	30.93	96.93
Other	83	3.07	100.00
Total	2706	100.00	

Types of security

	Freq.	Percent	Cum.
16 Collateral 1			
Agri. la	43	8.51	8.51
Building	10	1.98	10.50
Gold/sil	15	2.97	13.47
Property	10	1.98	15.45
Personal	128	25.35	40.79
Other	23	4.55	45.35
No colla	276	54.65	100.00
Total	505	100.00	

Interest rates versus loansize for each kind of lender.

There does not seem to be any obvious relationship between loans isxe and interest rates for any of the lender. Neither is there an obvious difference in the level of interest rates charges by different lenders.
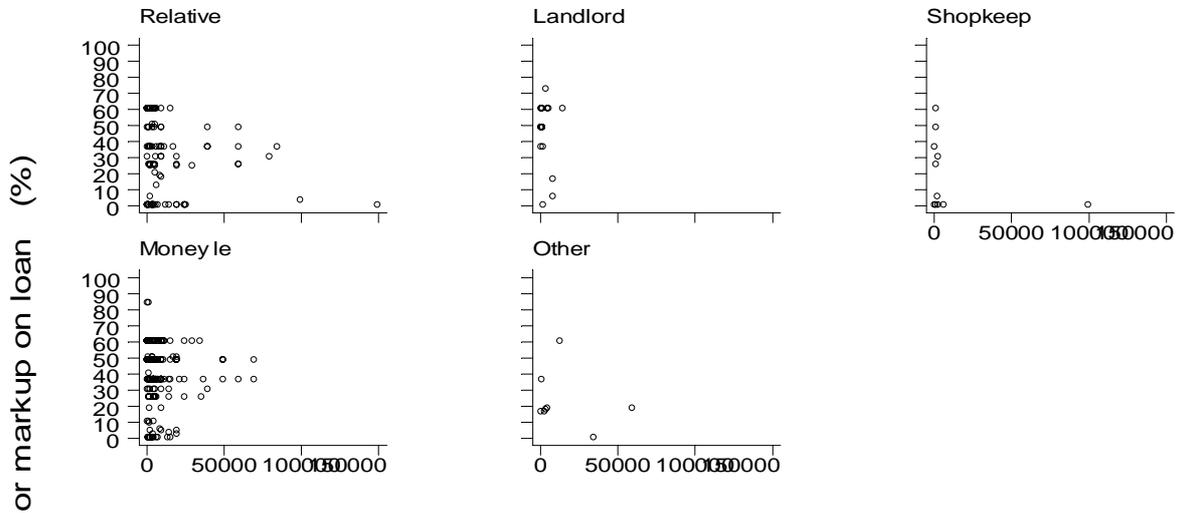
8 Amount borrowed   (Rs)
Graphs by 5 Place obtained

Repayments and overdue loans
```
gen paydelay= whenpay
(292 missing values generated)
drop if paydelay==.
(292 observations deleted)
tab paydelay
```

When loans are due
Nepal follows another calendar than the West. The NLSS data survey was conducted in Bikram yeas 2052-53. This corresponds to 1997 in the western calendar. All loans due before 52 are overdue at the time of the research.

paydelay	Freq.	Percent	Cum.
0	1	0.47	0.47
29	1	0.47	0.94
33	1	0.47	1.41
35	1	0.47	1.88
47	1	0.47	2.35
49	4	1.88	4.23
50	5	2.35	6.57
51	15	7.04	13.62
52	105	49.30	62.91
53	71	33.33	96.24
54	6	2.82	99.06
55	1	0.47	99.53

```
          59 |          1          0.47        100.00
-----------+-------------------------------
     Total |        213        100.00
```

```
gen diff=(52- whenpay>1)
drop diff
gen diff=(52-paydelay>1)
ren diff repdelay
drop paydelay
tab repdelay
```

Loans that are overdue

```
  repdelay |      Freq.      Percent         Cum.
-----------+-------------------------------
         0 |        199        93.43        93.43
         1 |         14         6.57        100.00
-----------+-------------------------------
     Total |        213        100.00
```