Association for Information Systems
AIS Electronic Library (AISeL)

ICIS 2009 Proceedings

International Conference on Information Systems (ICIS)

1-1-2009

The Role of Social Capital in People-to-People Lending Marketplaces

Martina E. Greiner
University of Nebraska at Omaha, mgreiner@unomaha.edu

Hui Wang
Radford University, hwang26@radford.edu

Follow this and additional works at: http://aisel.aisnet.org/icis2009

Recommended Citation
Greiner, Martina E. and Wang, Hui, "The Role of Social Capital in People-to-People Lending Marketplaces" (2009). *ICIS 2009 Proceedings.* Paper 29.
http://aisel.aisnet.org/icis2009/29

This material is brought to you by the International Conference on Information Systems (ICIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ICIS 2009 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

THE ROLE OF SOCIAL CAPITAL IN PEOPLE-TO-PEOPLE LENDING MARKETPLACES

Completed Research Paper

Martina E. Greiner
University of Nebraska at Omaha
1110 South 67th Street
Omaha, NE
mgreiner@unomaha.edu

Hui Wang
Radford University
801 East Main St.
Radford, VA
hwang26@radford.edu

Abstract

The objective of this paper is to investigate the role of social capital in for-profit People-to-People (P2P) lending marketplaces such as Prosper, the largest P2P lending marketplace in the US. We examine whether marketplace members (lenders, borrowers) are able to capitalize on borrowers' accumulated social capital. From a borrower's perspective, we investigate the influence of social capital on borrowers' chances to obtain funding and better interest rates in general as well as by borrower groups and over time. From a lender's perspective, we investigate the influence of borrowers' social capital on loan payment. We use data over a time span of two and a half years from Prosper, and analyze more than 200,000 loan requests and 27,500 loans. Our results suggest that social capital does not provide equal benefits to all members of Prosper and that mechanisms to promote social capital should be carefully designed.

Keywords: Online communities, E-finance, Electronic markets, P2P lending marketplaces

Introduction

People-to-people (P2P) lending (also called Peer-to-Peer or social lending) allows individuals to lend and borrow directly among each other without the mediation of a creditor bank institution. P2P lending marketplaces act as brokerages and help to connect people in need of money with people who want to invest money. P2P lending marketplaces use Web technologies to facilitate the transactions between the borrowers and lenders from the start of a loan request (e.g., match-making, searching for loan requests) until a loan matures (e.g., re-payment activities, collection activities). Borrowers would register at a P2P lending marketplace and provide some basic background data to the marketplace. Once approved, the borrower would create and publish a loan request (called listing) that describes the purpose and conditions of the desired loan. Lenders on the marketplace can search for listings and then bid on listings that are attractive to them and promise an adequate return on their investment. If the listing gets funded a loan is created and the P2P lending marketplace regulates the payment activities and, if necessary, takes measure when a loan becomes delinquent (i.e., is overdue).

The Harvard Business Review announced P2P lending to be one of the 20 breakthrough ideas for 2009 (Sviokla 2009), suggesting that the bank and credit crisis in 2008/2009 would stimulate the growth of lower risk P2P loans. However, profit-oriented online P2P lending marketplaces can still be considered to be in their early stage of evolution. Zopa UK, the oldest online P2P lending marketplace launched in 2005 (uk.zopa.com/ZopaWeb/public/help/help-faqs-interested.html), Prosper, the oldest US P2P lending marketplace, launched in 2006 (www.prosper.com/about/), and US second largest P2P lending marketplace Lending Club launched in 2007 (www.lendingclub.com/info/about-us.action). Since their launch, P2P lending marketplaces enjoyed a considerable growth rate in loan requests, loans, and member development (see Figure 1).

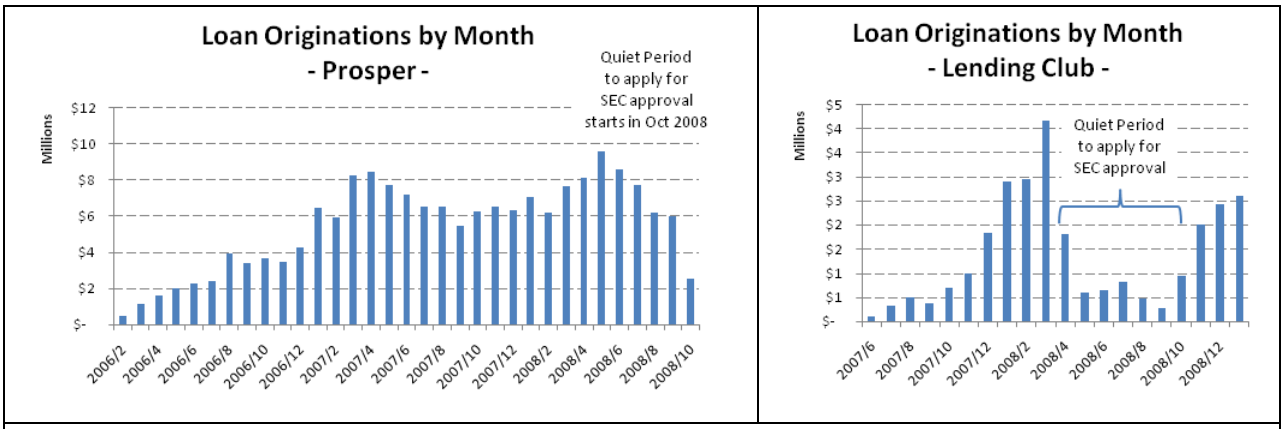

Figure 1: Loan Originations for US P2P Lending Marketplaces Prosper and Lending Club (Source: www.prosper.com, www.lendingclub.com)

P2P lending marketplaces claim that both borrowers and lenders can profit from P2P lending: borrowers are able to get better interest rates and lenders are able to reduce their risk and increase their returns on their investment by selecting their investments (i.e., borrower loans) themselves (Chris Larsen, CEO of Prosper in Hof (2006), Said (2006)). After two and a half years since the launch of Prosper's platform, more reliable information about loan performance is becoming available. As Prosper's loan duration is 36 months, time is needed for the borrowers to show how serious they take their responsibilities and pay back the loans in a timely manner. Table 1 shows the loan status (i.e., the percentage of loans that are paid and current, late, more than 4 months late, and defaulted) of loans with age 20 to 30 months. It is striking to note that around 35% of the loans are in some kind of delinquency. These numbers suggest that investing in P2P lending can be a risky business and that lenders need to pick the loans they want to invest in carefully. The numbers also suggest that P2P lending marketplaces should strive to help lenders make good investment decisions.

Table 1: Loan Performance for Prosper Loans by Loan Age[1] (Source: www.prosper.com as of October 2008)

	Loan Age										
	20	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Paid, Current	66%	66%	66%	63%	64%	66%	65%	66%	67%	71%	66%
Late	5%	5%	4%	4%	4%	3%	3%	4%	1%	5%	5%
4+ months late	18%	15%	14%	16%	11%	13%	11%	10%	11%	10%	6%
Defaulted	12%	14%	16%	17%	20%	18%	21%	19%	21%	14%	23%

The fundamental problem in online P2P lending is information asymmetry between the lenders and the borrowers. The lenders have less information about the borrowers' capabilities and willingness to pay back than the borrowers do. Hence, similar to Akerlof's example of the automobile market (Akerlof 1970), a lender does not know whether a loan will turn out to be a good investment (if the loan is paid back on time) or a "lemon" (if the loan becomes delinquent at any time before reaching maturity). Also, a borrower might have an incentive to misrepresent and overstate his/her ability and willingness to pay back for the sake of a lower interest rate. In such a market, if lenders are not able to distinguish the good loans from the lemons, adverse selection - good loans are driven out by lemons - may lead to a market failure (Akerlof 1970). Borrowers, on the other hand, need to convince the lenders that they are creditworthy candidates for loans.

We look at a particular source of information for borrowers to demonstrate their trustworthiness, namely, social capital. Banks use elaborate evaluation methods to evaluate borrowers' risk levels and include social factors in their risk evaluations to get more reliable risk assessments (Ferrary 2003). Similarly, group lending in microfinance rely on borrowers' social connections, such as group membership, to mitigate certain risks (Cassar et al. 2007; Everett 2008; Karlan 2007). However, in both examples, the relationships relied on for risk assessment are often very personal and include face-to-face contact. In contrast, the borrowers and the lenders in P2P lending marketplaces are often strangers and have limited personal and usually no face-to-face contact. Therefore, it is particularly challenging for P2P lending marketplaces to help borrowers build social capital.

P2P lending marketplaces have developed several ways to foster social capital. For example, Prosper uses two fundamental ways to build social connections among its members (www.prosper.com/connections). First, Prosper allows their members to connect with each other by creating networks of friends and endorsing each other. Second, Prosper borrowers and lenders are able to join groups which are lead by a group leader. Smava, a P2P lending marketplace in Germany, also uses a group system to allow its members to connect with each other (www.smava.de/Gemeinschaft+Aktivitaeten.html). In Lending Club, a lender is able to see whether s/he and the borrower have a shared background, for example, whether they live close to each other or went to the same school (www.lendingclub.com/browse/browseLoans.action). In addition, Smava and Zopa UK facilitate forums for their members to share their experiences, stories, and advise. On the one hand, these features allow marketplace participants to connect to each other. On the other hand, the features show whether and how a borrower is connected within the community of the P2P lending marketplace, i.e., it shows the borrower's social capital. In this paper, we focus on the social capital of the borrowers and investigate how the participants of P2P lending can benefit from this asset. Our research questions encompass:

- *What is the role of social capital in P2P lending?*

- *How can borrowers benefit from social capital?*

- *How can lenders benefit from social capital?*

The contribution of our paper is threefold. First, we contribute to the social capital theory by investigating the role of social capital in an online community of transaction. There is evidence of benefits of social capital in online communities of practice (e.g., knowledge sharing (Law and Chang 2008), collaboration in opens source communities (Tan et al. 2007; Wang 2005), but less work has been done in online communities of transaction. Second, we contribute to the emerging literature in P2P lending marketplaces by analyzing social capital and its

[1] Lending Club loans are not mature enough to provide reliable data.

benefits for both lenders and borrowers in more depth. Previous research looked at groups as intermediaries in P2P lending (Berger and Gleisner 2009), the operation and effectiveness of the Prosper P2P lending marketplace (Kumar 2007), trust-building mechanisms (Greiner and Wang 2007), Zopa UK P2P lending marketplace (Ortega and Bell 2008), the potential of P2P lending to create a more competitive credit market (Garman et al. 2008), groups and loan performances (Everett 2008), and social networks (Freedman and Jin 2008). We add to this line of research by looking specifically at the role of social capital from both the borrowers' and lenders' perspectives and also investigate different groups of borrowers and the development of social capital benefits over time. Third, our results give insights into the mechanics of social connections in P2P lending marketplaces and help to design better P2P lending marketplaces.

The paper is composed as follows. First, we introduce social capital theory and how social capital is represented in P2P marketplace Prosper. We continue by looking at the benefits that borrowers and lenders derive from social capital and develop our hypotheses. Second, we describe the methods we used to test our hypotheses and present the results. In the third section, we discuss some of the salient insights we gained from the results.

Theoretical Background and Hypotheses

Social Capital Theory

Social capital theory goes back to the notion of the "embeddedness" of economic behavior which suggests that economic behavior should not be analyzed without considering the constraints of ongoing social relations between individuals (Granovetter 1985). This is in contrast to classical and neoclassical economics' assumption of a competitive marketplace with autonomous actors acting independently from their social connections (Granovetter 1985). Conversely, social capital theory's central proposition is that an individual's network of relationships can provide a valuable resource for conducting social affairs (Bourdieu 1986; Nahapiet and Ghoshal 1998). Social capital can provide the members of a social network with "the backing of collectively-owned capital, a 'credential' which entitles them to credit, in the various senses of the word" (Bourdieu 1986, p.51). Social capital is an "umbrella concept" (Adler and Kwon 2002) and lacks a consistent definition. For our study, we adopt the definition of social capital from Nahapiet and Ghoshal (1998, p. 243) who define social capital as the "sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit". This definition encompasses the social network as well as the assets and resources that can be accessed and mobilized through the network (Nahapiet and Ghoshal 1998). Social capital is a multi-dimensional construct. Nahapiet and Ghoshal (1998) identified three main dimensions of social capital, namely structural, relational, and cognitive. The structural dimension describes whether and how people or entities are connected. Important aspects of the structural dimension are the presence or absence of network ties between people, network configuration (e.g., centralization or density), and appropriability (i.e., transferability of social capital to other contexts). The relational dimension of social capital describes the set of personal relationships that people have developed through interactions. The relational dimension focuses on the quality of relations such as respect and friendship between people. Important aspects are trust and trustworthiness, norms and sanctions, obligations and expectations, and identity and identification. The cognitive dimension relates to resources providing shared representation, interpretations, and systems of meanings. Important aspects are shared languages shared narratives that enable individuals within a network to have similar interpretations of events.

Social Capital in P2P Lending Marketplace Prosper

Social capital can take on many forms (Nahapiet and Ghoshal 1998) and should be set in its context. We want to investigate what forms social capital may take on in P2P lending marketplace Prosper. As described above, social capital is about the presence and configurations of social connections and networks between individuals. Prosper offers the following two basic mechanisms to foster social connections: groups and personal connections.

Groups are the first source of social capital in P2P lending marketplace Prosper. Prosper allows borrowers and lenders to join together in groups which can be created by any member of Prosper. Each group is lead by a group leader (usually the one who founds the group) whose tasks may include giving advice and suggestions to their group members, pre-screening potential borrowers before they join the group, making recommendations to potential lenders, and providing information about a particular borrower to lenders. Each group on Prosper is given a star

rating based on the loan performance of all loans associated with the group. Higher rated groups indicate that the loans of their group members outperform an expected default rate and a group's low star rating shows that their loans under perform. Groups may reflect all three dimensions of social capital identified by Nahapiet and Ghoshal (1998). First, they represent a social network between marketplace members that enable communication and provide access to information a borrower not connected to a group. Second, group membership may lead to additional norms and sanctions from other group members that might change the behavior and actions of a group member. Third, groups are often created around a common theme such as alumni affiliation, occupation, lending purpose etc. These may provide a common background and encourage shared language, and shared meaning among groups.

Personal connections between Prosper members can be a second source of social capital. Prosper allows its members to declare each other as friends and form networks of friends. These friend networks can show that the member is embedded in a social network within the marketplace. Prosper members are also able to recommend or endorse other members and providing more personal information about the member. Friends and endorsements connect Prosper members together in a less formal structure than groups offer; however, can still provide benefits. For example, a lender might perceive a borrower who has endorsements to be more creditworthy compared to a borrower with no perceived connection to other Prosper members.

Benefits of Social Capital to Borrowers

The first benefit of social capital that we want to discuss concerns the problem of a borrower to be able to signal creditworthiness to potential lenders. As discussed above, an important challenge for lenders is to differentiate the good listings from the "lemons" in the marketplace and to invest in listings that promise to being paid back by the borrower. The problem is information asymmetry between borrowers and lenders and that lenders need cues to evaluate whether a borrower is likely or not likely to pay back the future loan.

Berger and Gleisner (2009) argue that groups can play the role of intermediaries in P2P lending marketplaces by taking on several duties to reduce information asymmetries between borrowers and lenders. However, not all groups are created equal. Some groups require the listings to be pre-screened by the group leader to sort out bad loans that could hurt the group's reputation. Borrowers might send important documents and evidence about their economic background to the group leader. Thus, the group leader may have information about the borrower that go beyond of what the borrower reveal in their listing. With the number of listings offered on Prosper (252 new listings on average per day in 2007; this number excludes canceled and withdrawn listings) lenders are not able to contact each borrower themselves and request additional information. This task can be taken on by the group leader. Thus, borrowers who are part of a group - especially once who require pre-screening of the borrower – might be perceived of better risk than borrowers who are not. By membership in a group, borrowers may signal that they are creditworthy candidates for a loan.

Groups may provide another benefit from social capital for the borrower concerning signaling of creditworthiness (Greiner and Wang 2007). Groups are motivated to discipline members who are cheating because misbehavior of a single member could potentially harm other members and the group as a collective. Therefore, a group's reputation can serve as a proxy for determining an individual's creditworthiness (Ba and Pavlou 2002). Since Prosper groups are evaluated based on the repayment history of their loans, group members might be very interested to see their fellow members fulfill their payment obligations. Hence, lenders might infer from the group performance to that of the individual group member. Lenders might also believe that the group members will socially influence the group member to pay their loan in order to keep a good star rating. Thus, membership in a group with a good rating might signal creditworthiness (Greiner and Wang 2007). Prosper also allows lenders to support one or several groups. Being member of a group with many supporting lenders might signal trustworthiness, too.

Another benefit of social capital is access and exchange of information between group members (Adler and Kwon 2002; Coleman 1988). Groups may share their experience and knowledge among their group members. Group members are thus able to draw on the collective knowledge of the group. Group members in Prosper may have access to advice for the whole loan process: from the creation of a listing to help when problems arise after the loan is created. The volume of social capital depends on the size of an individual's network (Bourdieu 1986) which suggests that groups of different sizes provide different benefits to their members. Members of a large group have a larger collective knowledge stock to draw from than members of small groups. However, the quality of this knowledge depends on how much experience the groups have (Everett 2008). For example, a Prosper group with 300 members and 10 created loans might have less experience and knowledge than a group with 20 members and 30

loans. A member's place within the structure may also influence access and exchange of knowledge. A group leader is in the center of group activity and should therefore be able to get most benefits from the collective knowledge.

The personal social network of friends and endorsements at Prosper might also help a borrower to signal creditworthiness. Reputation of a seller is a determinant of creditworthiness in C2C purchasing behavior (McKnight et al. 2002; Melnik and Alm 2002; Strader and Ramaswami 2002). Similarly in P2P lending marketplaces, if others perceive the borrower to be trustworthy, the lender might believe in these qualities of the borrower as well (Greiner and Wang 2007). The size of the friend and endorsement network might increase the strength of this creditworthiness signal since it shows that other members have shown trust in the borrower (Greiner and Wang 2007). Another strong signal of trust might be if the friend, endorsement giver, group member, or group leader makes a bid on the listing thus showing that they trust the borrower (Freedman and Jin 2008). This suggest that an individual's personal relationships to others and social networks have the potential to be a basis for trust and for transferring and revealing trust (Nahapiet and Ghoshal 1998; Shapiro 1987). Based on above discussion, we conclude that lenders might interpret social capital of the borrower as a creditability signal in their decision to invest money and preferably bid on borrowers with a higher social capital. Previous studies also suggest that social networks help borrowers to get a better interest rate (Berger and Gleisner 2009; Freedman and Jin 2008). We propose:

H1: Social capital has a positive influence on the likelihood of getting funded

H2: Social capital reduces the interest rates a borrower is able to obtain

We believe that borrowers do not receive equal benefits from social capital. As mentioned above, lenders might use several cues to evaluate the creditworthiness of a listing - economic, social, and the listing itself. As previous research demonstrates, economic cues and in particular credit grades have an important influence on a lender's funding decision (Greiner and Wang 2007). Credit grades are based on the reported Experian credit scores and reflect a borrower's past history of payment performance and lender can predict future payment performance based on this data. Listings with lower credit grades can cause doubts whether the borrower is able and willing to re-pay the loan. At the same time, however, these loans suggest the highest nominal payback. The following table 2 shows the interest rates and delinquencies rates by credit grade for Prosper. This means that a good evaluation of the borrower's listing becomes even more essential if a lender decides to invest in higher risk listings. We propose that a lender will pay closer attention to a borrower's social capital when evaluating higher risk listings compared to lower risk listings.

H3: Social capital has an increasing influence with lower credit grade on the likelihood of getting funded and the interest rate a borrower is able to obtain

Table 2: Interest Rates and Loan Performance for Prosper Listings with Loan Age between 20 and 30 months by Credit Grade (Source: www.prosper.com as of October 2008)

	AA	A	B	C	D	E	HR
# of Loans	643	583	765	1103	1233	1430	1603
Loan Amount	$4,425,349	$4,828,179	$6,089,673	$7,265,744	$6,255,984	$5,314,797	$3,885,140
Avg. Interest Rate	9.3%	11.1%	14.0%	16.8%	20.2%	24.2%	24.2%
Current, Paid	92%	83%	80%	73%	70%	56%	41%
Late	1%	4%	3%	4%	5%	5%	5%
4 + Late	4%	6%	8%	14%	11%	15%	20%
Defaulted	2%	5%	8%	10%	14%	23%	34%

Social capital can be studied on the different levels of analysis such as individual, community, or nations level (Wang 2005). We are investigating social capital on an individual level and assess the influence of a marketplace member's social capital and the benefits derived from it. However, in the case of P2P lending marketplace, an individual's level of social capital is likely to depend on the level of social capital of the community as a whole. Groups as well as personal connections within the marketplace need be established and their group size grow over

time. Group ratings reflect the past performances of group member loans and thus will become more accurate and reliable over time as loans mature. So, there can be an argument made that social capital, of the community as well as of the individual, need time to grow in newly established communities such as Prosper. Thus, we conclude that social capital's influence on the likelihood of getting funded and obtaining lower interest rates will increase over time.

H4: Social capital has an increasing influence over time on the likelihood of getting funded and the interest rate a borrower is able to obtain

Benefits of Social Capital for Lenders

The main benefit lenders should obtain from a borrower's social capital is its influence on actual loan performance (Berger and Gleisner 2009). We argued above that borrower might be able to signal creditworthiness to lenders and that lenders might incorporate the borrower's social capital in their investment decisions. However, these cues only give lenders a benefit if they are really able to differentiate between the good and the bad loans. Only then can social capital help in a lender's investment decision. We discussed above that social capital can provide three benefits, namely, pre-selection of better listings by group leaders, knowledge and experience exchange between group members, and social pressure from group members and the social networks on the borrower to pay back on time. These three benefits of social capital should increase the payment performance of the borrower. This positive effect should have an even higher influence if the friends, endorsement giver, group members, or group leaders of the borrower's group have a stake in the loan. If the personal connections of a borrower also invested in the loan, a borrower might feel more obligated to pay back his/her loan on time. We therefore conclude:

H5: Social capital has a positive influence on loan payment

Method

Description of Dependent Variables, Independent Variables, and Control Variables

Most of the dependent and independent variables were selected based on prior literature. As discussed in the previous section, a borrower has two major sources of social capital: group membership and the support from his/her social network (i.e., friends, endorsement givers, the group leader, and other group members). We focus on four group characteristics: the rating of a group, whether a review is required before joining a group, the number of group loans per group member (as a proxy of the experience of the group), and the number of lenders who support the group. We focus on four social network variables: the number of endorsements, whether a listing has a bid from the members of the borrower's social network, whether the borrower is a group leader himself/herself, and the percentage of a loan that is funded by the borrower's social network. Table 3 gives an overview of the dependent variables and social capital independent variables.

Table 3: Description of Dependent and Social Capital Measures

Variable Name	Description	Resource (if applicable)	Used in
Dependent Variables			
Likelihood of Getting Funded	The percentage amount of the listing which has been funded. This can be calculated by dividing amount received / amount requested. [Continuous]	Greiner and Wang (2007)	H1, H3, H4
Spread above Prime Rate	Difference of borrower rate and Wall Street Journal Prime Rate. [Continuous]	Adapted from Everett (2008), Berger and Gleisner (2009)	H2, H3, H4
Loan Status	The status of the loan. [Ordinal: 0 = defaulted, 1= 4+ months late, 2 = up to 4 months late, and 3 = current and paid]	Adapted from Kumar (2007), Everett (2008)	H5

Independent Variables			
Group Rating	The rating of the associated group. [Ordinal; -1 = no group, 0 = low to 5 = high star rating]	Greiner and Wang (2007), Berger and Gleisner (2009), Freedman and Jin (2008)	H1-H5
Group Requires Listing Review	1 if a group's loan listing requires review by group leader. [Categorical 1=Yes, 0= No]	Berger and Gleisner (2009), Everett (2008), Freedman and Jin (2008)	H1-H5
Number of Group Loans per Member	Number of loans issued in the group per group member at the time of listing to serve as a proxy for experience and effective size of group. [Continuous]	Adapted from Everett (2008)	H1-H5
Number of Lenders Supporting Group	Number of lenders who support the group. [Continuous]		H1-H5
Number of Endorsements	Number of endorsements or recommendation a borrower has. [Continuous]	Adapted from Greiner and Wang (2007), Freedman and Jin (2008)	H1-H5
Bid from Social Network	Whether a listing has a bid from a friend, an endorsement giver, group leader, or group member of the borrower. [Categorical 1=Yes, 0= No]	Adapted from Freedman and Jin (2008), Berger (2009)	H1-H5
Is Group Leader	Whether the borrower is a group leader. [Categorical 1=Yes, 0= No]		H1-H5
% funds from Social Network	Total dollar of winning bids made by friends, endorsement givers, group leader, or group member divided by total dollar of winning bids. [Continuous]	Adapted from Freedman and Jin (2008), Everett (2008)	H5

In addition, to social capital, borrowers at Prosper have two other ways to demonstrate creditworthiness. First, Prosper gathers borrowers' economic background data (such as credit scores, income and debt information) that can be used to assess their abilities to pay back loans. Second, the borrowers can use the listings of loans to present themselves. A listing may include images, description of the loan purpose, and amount of the loan. Most of the control variables are identified in previous research as improving a borrower's access to credit and lowering interest rates (Berger and Gleisner 2009; Everett 2008; Freedman and Jin 2008; Greiner and Wang 2007; Kumar 2007): credit grade [1=HR (High Risk), 2=E, 3=D, 4=C, 5=B, 6=A, 7=AA], debt-to-income ratio [Continuous], whether the borrower is a homeowner [Categorical 1=Yes, 0= No], the maximum rate the borrower is willing to borrow at [Continuous], the amount requested [Continuous], whether the listing has an image [Categorical 1=Yes, 0= No], the length of the listing description [Continuous], whether the borrower had a previously successful listing [Categorical 1=Yes, 0= No], and the duration a listing is open for bidding [Continuous]. In contrast to social capital, these variables either describe the economic situation of the borrower or the listing itself and are thus different from social capital which lies in the social ties of a borrower.

Sample Description

We used data from Prosper.com, the largest P2P lending marketplace in the US. The data is publicly available on Prosper's Website. Additional verifications and data were collected by browsing Prosper's public listing, group, and member web pages. The sample contains loan requests from Prosper's launch on 2/13/2006 to the start of Prosper's quiet period[2] on 10/12/2008. First, listings that were withdrawn or canceled were deleted, leaving only listings that either expired (i.e., didn't get enough bids to get funded) or completed (i.e., listings were funded and converted to a

[2] Prosper halted business for six months to register with the SEC. Business resumed in May 2009.

loan). Second, listings with unknown debt-to-income ratio were deleted. Also removed were listings with credit grades of NC (no credit; discontinued). Third, the correct group rating and endorsements at the time of listing were calculated. Fourth, other measures, such as group characteristics, were added. The final sample consists of 201,885 listings, of which 27,633 were fully funded and became loans. Three samples were drawn from these listings to test the five hypotheses.

Table 4: Description and Correlations for Sample used to Test H1, H3(a), and H4(a)

n = 201,885 (all listings)	Min	Max	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Likelihood of Getting Funded	0	100	18.4	34.4																
2 Group Rating	-1	5	-0.2	1.6	.11 ***															
3 Group Requires Listing Review	0	1	0.1	0.3	.16 ***	.54 ***														
4 No of Group Loans per Group Member	0	13	0.0	0.3	.08 ***	.23 ***	.29 ***													
5 Number of Lenders Supporting Group	0	911	54.4	126.1	.10 ***	.59 ***	.42 ***	.26 ***												
6 Number of Endorsements	0	23	0.2	0.6	.13 ***	.19 ***	.20 ***	.07 ***	.13 ***											
7 Has Bid from Social Network	0	1	0.1	0.3	.28 ***	.34 ***	.39 ***	.16 ***	.36 ***	.27 ***										
8 Is Group Leader	0	1	0.0	0.1	.08 ***	.03 ***	.03 ***	.01 ***	.04 ***	.05 ***	.04 ***									
9 Credit Grade	1	7	2.4	1.6	.44 ***	-.02 ***	.02 ***	.01 ***	-.02 ***	.04 ***	.08 ***	.09 ***								
10 Debt to Income Ratio	0	1001	50.0	129.7	-.06 ***	.01 ***	.01 **	.00 n.s.	.00 n.s.	.01 **	.00 *	.00 n.s.	.01 ***							
11 Is Borrower Homeowner	0	1	0.3	0.5	.10 ***	-.02 ***	-.01 ***	.00 *	-.01 ***	.01 ***	.01 ***	.03 ***	.30 ***	.00 n.s.						
12 Borrower Maximum Rate	0	49.75	19.5	8.8	.12 ***	-.04 ***	-.01 ***	.00 n.s.	-.03 ***	.03 ***	.01 ***	-.04 ***	-.18 ***	-.03 ***	-.04 ***					
13 Amount Requested	1000	25000	7031.3	6126.1	-.06 ***	-.03 ***	-.02 ***	-.01 ***	-.04 ***	.02 ***	.00 n.s.	.01 ***	.34 ***	.09 ***	.19 ***	-.13 ***				
14 Listing has Image	0	1	0.5	0.5	.15 ***	.14 ***	.13 ***	.06 ***	.12 ***	.17 ***	.14 ***	.05 ***	.07 ***	-.02 ***	-.01 *	.06 ***	.00 n.s.			
15 Length of Listing Description	0	3994	1009.9	720.6	.15 ***	.24 ***	.23 ***	.11 ***	.22 ***	.24 ***	.27 ***	.04 ***	-.01 **	-.01 ***	.00 *	.10 ***	.02 ***	.34 ***		
16 Previous Successful Listings	-1	0	0.0	0.2	-.13 ***	-.08 ***	-.05 ***	-.08 ***	-.10 ***	-.07 ***	-.01 ***	-.09 ***	-.10 ***	.02 ***	-.05 ***	-.05 ***	.02 ***	-.07 ***	-.08 ***	
17 Listing Duration	0	14	7.3	1.9	.04 ***	.09 ***	.09 ***	.05 ***	.08 ***	.08 ***	.09 ***	.02 ***	.01 ***	-.01 **	-.03 ***	-.02 ***	.08 ***	.09 ***	.11 ***	-.01 ***

**** p< .001, ** p <.01, * p<.05, n.s. = not significant; SD = Standard Deviation*

Table 5: Description and Correlations for Sample used to Test H2, H3(b), and H4(b)

n = 27,633 (No of Loans)	Min	Max	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Spread Above Prime Rate	-8	42	11.3	7.6															
2 Group Rating	-1	5	0.1	2.0	-.03 ***														
3 Group Requires Listing Review	0	1	0.2	0.4	-.04 ***	.55 ***													
4 No of Group Loans per Group Member	0	13	0.1	0.3	.00 n.s.	.32 ***	.41 ***												
5 Number of Lenders Supporting Group	0	911	78.9	153.1	-.03 ***	.59 ***	.47 ***	.34 ***											
6 Number of Endorsements	0	23	0.4	0.9	.00 n.s.	.23 ***	.26 ***	.12 ***	.14 ***										
7 Has Bid from Social Network	0	1	0.3	0.4	-.07 ***	.44 ***	.49 ***	.25 ***	.44 ***	.32 ***									
8 Is Group Leader	0	1	0.0	0.2	-.13 ***	.02 **	.00 n.s.	.00 n.s.	.01 *	.03 ***	.01 n.s.								
9 Credit Grade	1	7	3.9	1.8	-.68 ***	-.13 ***	-.12 ***	-.07 ***	-.11 ***	-.05 ***	-.15 ***	.09 ***							
10 Debt to Income Ratio	0	1001	32.5	93.4	.02 **	.07 ***	.08 ***	.06 ***	.05 ***	.07 ***	.08 ***	.01 n.s.	.02 **						
11 Is Borrower Homeowner	0	1	0.4	0.5	-.18 ***	-.03 ***	-.05 ***	-.02 ***	-.02 ***	-.01 n.s.	-.05 ***	.04 ***	.35 ***	.02 ***					
12 Amount Requested	1000	25000	6173.1	5565.7	-.17 ***	.04 ***	.05 ***	.04 ***	.05 ***	.09 ***	.06 ***	.01 n.s.	.42 ***	.07 ***	.25 ***				
13 Listing has Image	0	1	0.7	0.5	-.01 *	.13 ***	.13 ***	.07 ***	.11 ***	.16 ***	.14 ***	.04 ***	-.03 ***	.03 ***	-.04 ***	.07 ***			
14 Length of Listing Description	0	3938	1229.3	812.6	.12 ***	.26 ***	.26 ***	.14 ***	.23 ***	.24 ***	.29 ***	.00 n.s.	-.22 ***	.07 ***	-.07 ***	.07 ***	.32 ***		
15 Previous Successful Listings	-1	0	-0.1	0.3	-.03 ***	-.03 ***	.02 **	-.06 ***	-.04 ***	-.04 ***	.05 ***	-.06 ***	-.03 ***	.01 n.s.	-.04 ***	.00 n.s.	-.02 ***	-.01 n.s.	
16 Listing Duration	3	14	7.5	1.9	-.03 ***	.14 ***	.14 ***	.08 ***	.13 ***	.11 ***	.16 ***	.03 ***	-.03 ***	.02 ***	-.04 ***	.11 ***	.10 ***	.15 ***	.00 n.s.

**** p< .001, ** p <.01, * p<.05, n.s. = not significant; SD = Standard Deviation*

Table 6: Description and Correlations for Sample used to Test H5

n =14,417 (loan age > 12 months)	Min	Max	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Loan Payment	0	3	2.4	1.1																	
2 Group Rating	-1	5	0.7	2.2	.00 n.s.																
3 Group Requires Listing Review	0	1	0.3	0.5	-.01 n.s.	.48 ***															
4 No of Group Loans per Group Member	0	11	0.1	0.3	-.03 **	.25 ***	.36 ***														
5 Number of Lenders Supporting Group	0	911	127.7	179.5	-.02 *	.61 ***	.41 ***	.27 ***													
6 Number of Endorsements	0	23	0.4	0.9	.02 **	.24 ***	.28 ***	.11 ***	.18 ***												
7 Has Bid from Social Network	0	1	0.4	0.5	-.02 **	.36 ***	.42 ***	.20 ***	.43 ***	.30 ***											
8 Is Group Leader	0	1	0.1	0.2	.09 ***	-.03 **	-.04 ***	-.03 ***	-.03 ***	.00 n.s.	-.04 ***										
9 % of Loan Funded by Social Network	0	100	3.3	12.4	-.02 *	.02 *	.16 ***	.06 ***	-.01 n.s.	.12 ***	.31 ***	-.02 **									
10 Credit Grade	1	7	3.6	1.9	.33 ***	-.06 ***	-.08 ***	-.03 ***	-.05 ***	-.02 n.s.	-.11 ***	.14 ***	-.15 ***								
11 Debt to Income Ratio	0	1001	37.4	118.5	-.01 n.s.	.05 ***	.07 ***	.06 ***	.03 ***	.07 ***	.06 ***	.00 n.s.	.04 ***	.03 ***							
12 Is Borrower Homeowner	0	1	0.4	0.5	.06 ***	.00 n.s.	-.03 ***	.00 n.s.	.02 *	.01 n.s.	-.03 ***	.07 ***	-.06 ***	.33 ***	.03 ***						
13 Borrower Maximum Rate	0	49.75	19.8	6.4	-.33 ***	.04 ***	.04 ***	.04 ***	.05 ***	.05 ***	.03 ***	-.15 ***	-.11 ***	-.73 ***	.04 ***	-.20 ***					
14 Amount Requested	1000	25000	6122.6	5564.4	.03 **	.07 ***	.07 ***	.05 ***	.09 ***	.13 ***	.08 ***	.01 n.s.	-.07 ***	.39 ***	.08 ***	.24 ***	-.07 ***				
15 Listing has Image	0	1	0.7	0.5	.00 n.s.	.15 ***	.16 ***	.08 ***	.13 ***	.16 ***	.17 ***	.04 ***	.01 n.s.	-.04 ***	.03 ***	-.04 ***	.01 n.s.	.08 ***			
16 Length of Listing Description	0	3938	1333.8	879.6	-.08 ***	.23 ***	.24 ***	.12 ***	.21 ***	.24 ***	.30 ***	-.04 ***	.08 ***	-.24 ***	.07 ***	-.07 ***	.21 ***	.09 ***	.33 ***		
17 Previous Successful Listings	-1	0	0.0	0.2	-.05 ***	-.02 n.s.	.00 n.s.	-.03 ***	-.02 *	.00 n.s.	.00 n.s.	-.08 ***	.00 n.s.	-.05 ***	.00 n.s.	-.04 ***	.05 ***	-.07 ***	.01 n.s.	.02 *	
18 Listing Duration	3	14	7.7	2.1	-.02 *	.12 ***	.12 ***	.06 ***	.12 ***	.09 ***	.15 ***	.01 n.s.	.00 n.s.	-.03 **	.01 n.s.	-.04 ***	.04 ***	.13 ***	.12 ***	.15 ***	-.01 n.s.

**** p< .001, ** p <.01, * p<.05, n.s. = not significant; SD = Standard Deviation*

The first sample contains all 201,885 listings and was used to test hypotheses H1, H3(a), and H4(a). Second, in order to test hypotheses H2, H3(b) and H4(b), a sample containing only fully-funded listings (i.e., a loan was created) was created, as only interest rates of fully funded listings can be bidden down. The third sample contains loans that are older than one year to avoid introducing a bias by including young loans that have not had time to become delinquent or default. Table 4 to Table 6 depict the sample description and correlations for all three samples.

In order to test our hypotheses we performed hierarchical multiple linear regression using SPSS 17.0. This allows us to control for the influence of non-social capital variables on the dependent variables. The control variables are first introduced in model 1. In a second model, the social capital variables are entered. The resulting R^2-change allows to see how much of the variance in the dependent variables can be explained by the SC variables. For all hypotheses, we tested for multicollinearity and autocorrelation. For all samples, the significant (at $p<.001$) Pearson correlations between the independent variables are all well below .8, the tolerance values are greater than 0.1 and VIF values less than 10; no multicollinearity problem among the predictors was found. Autocorrelation was checked as the data were collected over a time period of two and a half years. The Durbin-Waston values were well above 1.0 (most close to 2); no indication of autocorrelation was found.

Results

H1: Social capital has a positive influence on the likelihood of getting funded

H1 asserts that everything else being equal, listings posted by borrowers with higher social capital have better chances of getting funded. We tested H1 with a linear regression model with social capital (SC) variables as the independent variables and the ratio of received bid amounts against requested as the dependent variable (DV). H1 is supported. SC variables account for 4.4% (adj. R^2-Change, significant at $p<.001$) of the variation in the dependent variable; SC and control variables (Model 2) account for 35.2% of the variation (see Table 7).

Table 7: Results for Testing Hypothesis H1 with Dependent Variable Likelihood of Getting Funded

n = 201,885 (All Listings)	**Model 1** (Control Variables)	**Model 2** (Control and SC Variables)
Credit Grade	.545 ***	.522 ***
Debt to Income Ratio	-.041 ***	-.044 ***
Is Borrower Homeowner	-.013 ***	-.011 ***
Borrower Maximum Rate	.169 ***	.173 ***
Amount Requested	-.221 ***	-.209 ***
Listing has Image	.056 ***	.042 ***
Length of Listing Description	.113 ***	.051 ***
Previous Successful Listings	-.045 ***	-.045 ***
Listing Duration	.035 ***	.019 ***
Group Rating		.013 ***
Group Requires Listing Review		.047 ***
No of Group Loans per Group Member		.010 ***
Number of Lenders Supporting Group		-.021 ***
Number of Endorsements		.022 ***
Has Bid from Social Network		.188 ***
Is Group Leader		.028 ***
Adj. R^2	30.8%	35.2%
Adj. R^2 Change		4.4%
Std. Error of the Estimate	28.630	27.719
F-statistic	9996.421	6843.127
Sig.	.000	.000
Sig. F. Change	.000	.000

**** p< .001, ** p <.01, * p<.05, n.s. = not significant*

Group rating is significant and positively related to the likelihood of getting funded as predicted which means that belonging to a higher rated group improves borrowers' chances of getting funded. Whether a group requires the listings of its group members to be reviewed is also positively related to the DV as is the weighted number of loans of a group. Endorsements increase the chance of getting funded as well as having bids from the social network. Being a group leader also improves chances of getting funded. Contrary to expected, the number of lenders supporting a group does not improve group member's chances of getting funded.

H2: Social capital reduces the interest rate a borrower is likely to obtain

H2 asserts that everything else being equal, borrowers with more social capital are likely to get lower interest rates for their loans. H2 tests the influence of borrowers' social capital on the "spread above prime rate," the difference between the actual interest rates borrowers get and the prime rate reported by the Wall Street Journal. H2 is supported. SC variables account for 3.7% (adj. R^2-Change, significant at p<.001) of the variation in the dependent variable; SC and control variables (Model 2) account for 52.0% of the variation (see Table 8).

Group rating, required group listing review, number of lenders supporting group, has bid from social network, and is group leader are all negatively related to the DV, as hypothesized. These SC variables help borrowers to get lower interest rates. Some SC variables are related to DV in direction contrary to expected. The weighted number of loans of a group and the number of endorsements are positively related to the DV, suggesting that these social capital variables lead to higher interest rates. The positive influence of weighted number of loans could be explained that as group loans per member increase so does the payback burden on the borrowers belonging to this group. Although, lenders might prefer such a listing - as suggested in the results of H1 - they might request an additional risk premium. Please note that borrower maximum rate was removed from the analysis since it highly correlates with realized borrower rate – a variable that is part of the dependent variable.

Table 8: Results for Testing Hypothesis 2 with Dependent Variable Spread above Prime Rate

n = 27,633 (All loans)	**Model 1** (Control Variables)	**Model 2** (Control and SC Variables)
Credit Grade	-.773 ***	-.792 ***
Debt to Income Ratio	.022 ***	.034 ***
Is Borrower Homeowner	.041 ***	.041 ***
Amount Requested	.159 ***	.170 ***
Listing has Image	-.026 ***	-.014 **
Length of Listing Description	-.047 ***	.001 n.s.
Previous Successful Listings	-.058 ***	-.055 ***
Listing Duration	-.059 ***	-.034 ***
Group Rating		-.039 ***
Group Requires Listing Review		-.051 ***
No of Group Loans per Group Member		.011 *
Number of Lenders Supporting Group		-.017 **
Number of Endorsements		.017 ***
Has Bid from Social Network		-.141 ***
Is Group Leader		-.058 ***
Adj. R^2	48.6%	52.3%
Adj. R^2 Change		3.7%
Std. Error of the Estimate	5.442	5.244
F-statistic	3268.524	2020.072
Sig.	.000	.000
Sig. F. Change	.000	.000

**** p< .001, ** p <.01, * p<.05, n.s. = not significant*

H3: Social capital has an increasing influence with lower credit grade.

H3 was tested using two models with different DVs:

H3.a Dependent Variable: Likelihood of getting funded

H3.b Dependent Variable: Spread above Prime Rate

The first DV (H3.a) is the portion of a listing that is funded, used as a measure of the likelihood of getting funded; the second DV (H3.b) is the difference between actual loan interest rate and the prime rate, a measure of the interest rate a borrower may get. Both models were tested in seven different credit grade groups. Listings were grouped according to borrowers' credit grades. H3 asserts that the influence of the SC variables will get stronger as credit grades gets worse. The adj. R^2- change when adding the social capital variables to the control variables of all seven groups is reported in Table 9. H3.a is supported. The adj. R^2-change in H3.a is strictly increasing from credit group AA (1.6%), the best, to credit group HR (8.2%), the one considered most risky. Interestingly, the SC accounted R^2 increases and the full model R^2 decreases as the credit grades get worse. Apparently, the influence of the SC variables picks up as credit degrades even when the full model becomes less and less influential.

Table 9: Results for Testing Hypothesis 3 (a) with Dependent Variable Likelihood of Getting Funded

	AA		A		B		C		D		E		HR	
	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change
Adj. R2	34.5%	1.6%	32.3%	3.1%	26.9%	3.7%	25.2%	5.4%	23.1%	6.8%	22.2%	6.9%	19.7%	8.2%
St. Error	35.086	-	36.870	-	38.040	-	36.599	-	32.488	-	25.502	-	17.931	-
F	208.521	-	227.089	-	277.598	-	459.960	-	591.068	-	695.176	-	1487.076	-
Sig.	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-
Sig. of Change	-	0.000	-	0.000	-	0.00	-	0.000	-	0.000	-	0.000	-	0.000

The analysis of H3.b is inconclusive (see Table 10). Although the adj. R^2-change in the two highest risk groups E (10.9%) and HR (8.5%) are higher than those in the low risk groups AA (4.5%) and A (6.4%), the adj. R^2-change in higher risk group D (5.4%) is lower than those in the lower risk group A (6.4%).

Table 10: Results for Testing Hypothesis 3 (b) with Dependent Variable Spread above Prime Rate

	AA		A		B		C		D		E		HR	
	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change	Total R^2	SC R^2 change
Adj. R2	42.7%	4.5%	31.1%	6.3%	20.3%	6.9%	10.4%	6.2%	8.1%	5.4%	13.4%	10.9%	10.3%	8.5%
St. Error	2.461	-	3.530	-	4.233	-	5.560	-	5.934	-	5.679	-	6.613	-
F	173.792	-	101.732	-	75.948	-	46.557	-	32.622	-	36.545	-	29.291	-
Sig.	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-
Sig. of Change	-	0.000	-	0.000	-	0.00	-	0.000	-	0.000	-	0.000	-	0.000

H4: Social capital has an increasing influence over time

H4 was tested using the same two DVs as H3:

H4.a Dependent Variable: Likelihood of getting funded

H4.b Dependent Variable: Spread above Prime Rate

In order to test hypothesis 4 we split our samples into 10 consecutive time groups from the second quarter in 2006 to the third quarter of 2008 and run hierarchical multiple regression for each of the groups. H4 asserts that the influence of the SC variables will get stronger over time as social capital has time to grow. H4 was not supported. The analysis shows that the influence of SC variables in both models increases with time in 2006 and early 2007 and then decreases. In H4.a, the adj. R^2 (see Table 11) increases from 4.3% in Q2 to 2006 to around 5.8% until the first quarter in 2007, but then drop constantly to 1.5% in quarter 3 of 2008. In H4.b (see Table 12), the adj. R^2 shows a similar n-shaped pattern, reaching a peak around mid-2007 then decreasing below the level of 2006.

Table 11: Results for Testing Hypotheses 4 (a) with Dependent Variable Likelihood of Getting Funded

	2006/Q2		2006/Q3		2006/Q4		2007/Q1		2007/Q2		2007/Q3		2007/Q4		2008/Q1		2008/Q2		2008/Q3	
	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge
Adj. R2	35.7%	4.3%	46.6%	5.9%	41.0%	5.8%	42.4%	5.8%	43.8%	4.4%	43.3%	3.3%	37.4%	2.4%	33.7%	1.7%	32.1%	1.5%	31.7%	1.5%
St. Error	26.681	-	27.149	-	26.480	-	28.543	-	25.432	-	23.529	-	23.685	-	28.059	-	29.857	-	29.916	-
F	385.073	-	625.074	-	773.961	-	820.468	-	1107.189	-	1163.966	-	1008.702	-	701.493	-	762.461	-	589.352	-
Sig.	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-
Sig. of Change	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000

Table 12: Results for Testing Hypotheses 4 (b) with Dependent Variable Spread Above Prime Rate

	2006/Q2		2006/Q3		2006/Q4		2007/Q1		2007/Q2		2007/Q3		2007/Q4		2008/Q1		2008/Q2		2008/Q3	
	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge	Total R^2	SC R^2 chge
Adj. R2	67.2%	0.7%	67.2%	1.4%	57.9%	1.8%	72.5%	1.6%	65.6%	1.8%	68.8%	3.0%	59.1%	2.1%	54.5%	0.9%	49.4%	0.7%	59.1%	0.3%
St. Error	3.485	-	3.957	-	4.461	-	3.455	-	3.708	-	3.440	-	4.342	-	5.216	-	5.976	-	5.813	-
F	191.421	-	262.482	-	226.615	-	552.472	-	381.974	-	376.572	-	244.360	-	245.987	-	265.360	-	315.153	-
Sig.	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-
Sig. of Change	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000

H5: Social capital of the borrower has a positive influence on loan payment

H5 asserts that the more social capital a borrower has, the more likely the borrower will pay back their loan on time. We tested three models (see Table 13). The first model includes only the control variables. The second model includes all social capital variables we used in hypotheses 1-4. The third model includes an additional social capital variable that measures the stake a member of the borrower's social network has in the loan (% of loan funded by social network). This variable was not included in the testing of hypotheses H1-H4 because lenders don't know the winning bids before the auction ends and are not able to use these variables as decision factors.

Table 13: Results for Testing Hypothesis H5 with Dependent Variable Loan Payment

n = 14,418 (Loan Age > 12 Months)	**Model 1** (Control Variables)	**Model 2** (Control and SC Variables H1-H4)	**Model 3** (Control and all SC Variables)
Credit Grade	.268 ***	.269 ***	.263 ***
Debt to Income Ratio	-.007 n.s.	-.009 n.s.	-.009 n.s.
Is Borrower Homeowner	-.038 ***	-.040 ***	-.040 ***
Borrower Maximum Rate	-.152 ***	-.147 ***	-.153 ***
Amount Requested	-.086 ***	-.089 ***	-.089 ***
Listing has Image	.011 n.s.	.005 n.s.	.004 n.s.
Length of Listing Description	.018 *	.008 n.s.	.008 n.s.
Previous Successful Listings	-.034 ***	-.032 ***	-.032 ***
Listing Duration	-.001 n.s.	-.004 n.s.	-.004 n.s.
Group Rating		.034 **	.033 **
Group Requires Listing Review		.006 n.s.	.007 n.s.
No of Group Loans per Group Member		-.019 *	-.019 *
Number of Lenders Supporting Group		-.017 n.s.	-.018 n.s.
Number of Endorsements		.042 ***	.043 ***
Has Bid from Social Network		-.001 n.s.	.003 n.s.
Is Group Leader		.026 **	.025 **
% of Loan Funded by Social Network			-.013 n.s.
Adj. R^2	13.4%	13.7%	13.7%
Adj. R^2 Change		0.3%	0.0%
Std. Error of the Estimate	0.996	0.994	0.994
F-statistic	249.327	144.470	136.110
Sig.	.000	.000	.000
Sig. F. Change	.000	.000	.141

**** p< .001, ** p <.01, * p<.05, n.s. = not significant*

H5 is partially supported. When the social capital variables are included, the gain in the adj. R^2 is significant (Model 2). However, the change is quite small (0.3%). Adding the additional variable, the percentage of loan funded by social network, did not significantly increase the explanatory power of our model (Model 3). Four social capital variables out of eight are insignificant (see Table 13, Model 3). Group rating, the number of endorsements, and is group leader are significant and have the predicted positive relationship with the dependent variable. Contrary to our prediction, the number of loans per group member (a proxy of the experience of the group) is significant but has a negative influence on loan payment. This again could be explained by the fact that the more group loans per group member a group has, the higher the payback burden on the borrowers of the group. This might suggest that the benefits of a bigger collective group knowledge is smaller than the negative effect of the higher payback burden of each group member.

Discussion

The empirical analysis showed that social capital does influence borrowers' ability to get funded and get better interest rates. In general, borrowers with more social capital tend to get funded and obtain lower interest rates. Moreover, the influences are different across credit grades and time. The most important insights gained from the analysis are discussed in this section.

Social Capital's Different Importance for Different Borrower Groups

An interesting finding is that social capital is not equally important for all borrower groups. Social capital seems to be more influential for borrowers with low credit grades (e.g., E, HR) than for those with high credit grades (e.g., AA, A) for both the likelihood of getting funded and obtaining better interest rate (see Table 9 and Table 10). More interestingly, for both dependent variables, the explanatory power of the full model (including economic and listings characteristics variables) decreases as credit grades get worse. This means that for high credit grade groups, the explanatory power comes largely from non-SC variables, and for low credit grade groups, the explanatory power comes largely from SC variables. This finding supports our argument that lenders use more social cues about a borrower to make investment decisions when his/her credit grade is low.

The elaboration likelihood model (ELM) may provide an explanation for why the full model has less explanatory power as credit grades get worse. ELM explains attitude change as a result of two types of evaluation, that of issue-relevant information such as the message itself, e.g., in our context what does the borrower say about why s/he needs the loan; and that of peripheral cues, e.g., in our context credit grade, debt-to-income ratio, or group membership (Petty and Cacioppo 1981). ELM posits that if a person does not have the motivation or ability to evaluate issue-relevant information, s/he will rely on simple heuristics derived from peripheral cues due to less cognitive effort required (Corritore et al. 2003). Peripheral cues are thus factors that produce attitude change without the need to evaluate the listing content in detail. Our models test the influence of peripheral cues on lenders' decisions but do not incorporate other factors such as the contents of the listings (e.g., emotional influence of image, purpose of loan). We argue that in cases of good credit grades, lenders believe that risks are small and are likely to depend on peripheral cues to make decisions, hence the good explanatory power of our model. When the credit grades are low, risks are too high for lenders to depend on peripheral cues alone so that they turn to factors that are not included in the model, therefore the explanatory power of the model is low.

Social Capital's Influence over Time

The results show that the influence of social capital changes over time. However, surprisingly, social capital's influence on getting funded peaked in the first two quarters in 2007 and steadily declined afterwards - contrary to our hypothesis (see Table 11 and Table 12). With our current knowledge, our explanation can only be speculative and future research should focus on Prosper's group system. Anecdotal stories on Prosper related forums and blogs indicate that the implementation of the group system idea by Prosper might not have been ideal which in turn might have influenced our findings (e.g., forum www.prospers.org). For example, a Prosper member writes in an open letter to Prosper: "First, while there may be 1 or 2 groups out there somewhere in the 3600 Prosper groups which actually has the dynamic [Chris Larsen, Prosper's CEO] envisioned, 99.9% of them do not. Most are groups of people who don't know each other at all. No commitment. No shame." (Fred93 2007). One main problem was apparently based on inappropriate group incentives (Anderson 2007; Fred93 2007). Until September 2007, group

leaders could receive a "group leader reward" for every loan created that was associated with his/her group. Some group leaders tried to promote and push loans that were of high risk to the lenders in order to increase their size and the group leader reward for themselves. Apparently, the group leader reward turned out to be a bad incentive. These bad loans might have damaged the reputation of groups on Prosper and might explain why fewer listings belonging to groups were created after the peak in the first two quarters in 2007 and might also partially explain why social capital gets less important over time. These events don't necessarily show that group and group membership are a bad idea in general in P2P lending marketplaces. However, it indicates that social networks need to be designed carefully with benefits for both, borrower and lenders in mind, as well as correctly and thoughtfully planned incentives to its group members.

Influence of Social Capital on Loan Payment

It was hypothesized that social capital helps to reduce delinquencies. However, the empirical results provide very limited support for that. Although the R^2-change when adding the SC variables in hypothesis 5 is statistically significant, it is very low (see Model 2, Table 13). An R^2-change of 0.3% means that by introducing social capital variables we can only explain an additional 0.3% of variance in loan performance. So, apparently although lenders include social capital cues of the borrower in their decision to bid on a listing, the same variables are not good predictors of whether the borrower is going to re-pay their loan. This might suggest that the benefits of groups reported from other contexts such as microcredits (Cassar et al. 2007; Karlan 2007) could not be translated into Prosper's P2P lending marketplace. It might be that borrower groups lack the kind of personal and face-to-face contact needed to develop the feelings of trust, obligations, and solidarity. Prosper's co-founder and CEO Chris Larsen states: "Credit markets have destroyed the sense of commitment and shame if you don't pay. [...] So we try to make sure buyers are tightly associated with a group, whose reputation is directly impacted by one person not paying. That should dramatically lower default costs." (Hof 2006). However, our results suggest that groups might not be a good replacement for institutional mechanisms such as efficient collection mechanisms and P2P lending marketplaces should not only rely on social networks for borrower obligation to payback a loan. Surprisingly, even when considering the stakes a borrower's close social network (friends, endorsement giver, group members, and group leaders) has in the loan, the explanatory power of the social capital variables did not increase (see Model 3, Table 13). Finally, our results also suggest that lenders should not only rely on social capital (groups and friends) when making their investment decisions. Clearly, better factors to assess borrower risks need to be developed for P2P lending marketplaces.

Limitations and Disclaimer

Our study has several limitations. First, we used archival data which might overlook salient factors. Second, we examined data from one single P2P lending marketplace. The results might not be readily transferable to other marketplaces, especially since other marketplaces might have other ways than groups or friend networks to connect their members. Third, we relied on quantitative measures only. A lender's decision to bid on a listing is likely to be more complex and involves qualitative measures, such as the purpose of the loan and the quality of the picture. A disclaimer to make is that we don't want to overstate the default rates and give misleading information to potential lenders and borrowers. Although the data is from a time span of two and a half years and should give reliable results, the real estate and credit crisis in 2008/2009 might have contributed to the high delinquency rates as well as caused the low R^2 in hypothesis 5.

Conclusion - The Role of Social Capital in P2P Marketplaces

We empirically investigated the role of social capital using two and a half years of loan history from the largest P2P lending marketplace in the U.S. We found that, although social capital plays a role in this marketplace, the participants do not benefit equally from social capital. Borrowers, and especially high-risk borrowers, benefit most from social capital as they are more likely to get better chances of getting funded and obtain lower interest rates. However, social capital is apparently not a good predictor of loan payment and, hence, social capital does not necessarily help lenders in making better investment decisions.

References

Adler, P.S., and Kwon, S.-W. "Social Capital: Prospects for a New Concept," *The Academy of Management Review* (27:1) 2002, pp 17-40.

Akerlof, G.A. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," *The Quarterly Journal of Economics* (84:3) 1970, pp 488-500.

Anderson, B. "A Look Back at Prosper's Second Year," in: *NuWire Investor*, last accessed May 5th, 2009, 2007.

Ba, S., and Pavlou, P.A. "Evidence of the Effect of Trust Building Technology in Electronic Markets: Price Premiums and Buyer Behavior," *MIS Quarterly* (26:3) 2002, pp 243-268.

Berger, S., and Gleisner, F. "Emergence of Financial Intermediaries on Electronic Markets: The Case of Online P2P Lending," in: *Business Research; forthcoming*, Working Paper from SSRN.com, 2009.

Bourdieu, P. "The Forms of Capital," in: *Handbook of Theory of Research for the Sociology of Education,* J.E. Richardson (ed.), Greenword Press, Westport, Conn., 1986.

Cassar, A., Crowley, L., and Wydick, B. "The Effect of Social Capital on Group Loan Repayment: Evidence from Field Experiments " *Economic Journal* (117:517) 2007, pp 85-106.

Coleman, J.S. "Social Capital in the Creation of Human Capital," *American Journal of Sociology* (94 Number S1: S95:1) 1988, pp 95--120.

Corritore, C.L., Kracher, B., and Wiedenbeck, S. "On-Line Trust: Concepts, Evolving Themes, a Model," *International Journal Human-Computer Studies* (58:6) 2003, pp 737-758.

Everett, G.R. "Group membership, Relationship Banking and Default Risk: The Case of Online Social Lending," in: *http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1114428*, 2008.

Ferrary, M. "Trust and Social Capital in the Regulation of Lending Activities," *Journal of Socio-Economics* (31) 2003, pp 673-699.

Fred93 "Open Letter #1 to Prosper.com: Don't Mislead People," in: *http://www.prospers.org/blogs/media/blogs/Fred93/open-letter-number-1.pdf*, 2007.

Freedman, S., and Jin, G.Z. "Do Social Networks Solve Information Problems for Peer-to-Peer Lending? Evidence from Prosper. com," in: *http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1304138*, 2008.

Garman, S., Hampshire, R., and Krishnan, R. "Person-to Person Lending: The Pursuit of (More) Competitive Credit Marktes," ICIS, 2008.

Granovetter, M. "Economic Action and Social Structure: The Problem of Embeddedness," *The American Journal of Sociology* (91:3) 1985, pp 481-510.

Greiner, M., and Wang, H. "Building Consumer-to-Consumer Trust in e-Finance Marketplaces," *Proceedings of Thirteenth Americas Conference on Information Systems*, August 9-12, Keystone, Colorado, 2007.

Hof, R. "Prosper: The eBay of Loans?," in: *Business Week*, http://www.businessweek.com/technology/content/feb2006/tc20060213_147523.htm, 2006.

Karlan, D.S. "Social Connections and Group Banking," *The Economic Journal* (117) 2007, pp 52-84.

Kumar, S. "Bank of One. Empirical Analysis of Peer-to-Peer Financial Marketplace," *Proceedings of Thirteenth Americas Conference on Information System*, August 9-12, Keystone, Colorado, 2007.

Law, S.P.-M., and Chang, M.K. "Fostering Knowledge Exchange in Online Communities: A Social Capital Building Approach," *Proceedings of Twenty Ninth International Conference on Information Systems*, Paris, 2008.

McKnight, D.H., Choudhury, V., and Kacmar, C. "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology," *Information Systems Research* (13:3) 2002, pp 334-359.

Melnik, M.I., and Alm, J. "Does a Seller's Ecommerce Reputation Matter? Evidence from ebay auctions," *The Journal of Industrial Economics* (L:3) 2002, pp 337-349.

Nahapiet, J., and Ghoshal, S. "Social Capital, Intellectual Capital, and the Organizational Advantage," *Academy of Management Review* (23:2) 1998, pp 242-266.

Ortega, A.C.B., and Bell, F. "Online Social Lending: Borrower-Generated Content," Proceedings of Fourteenth Americas Conference on Information Systems, 2008.

Petty, R.E., and Cacioppo, J.T. *Attitudes and Persuasion: Classic and Contemporary Approaches* Westview Press, 1981.

Said, C. "Site hooks up Lenders, Borrowers," in: *San Fransisco Chronicle*, retrieved from: http://sfgate.com/cgi-bin/article.cgi?f=/c/a/2006/03/06/BUGCQHIAEP1.DTL, 2006.

Shapiro, S.P. "The Social Control of Impersonal Trust," *American Journal of Sociology* (93:3) 1987, pp 623-658.

Strader, T.J., and Ramaswami, S.N. "The Value of Seller Trustworthiness in C2C Online Markets," *Communications of the ACM* (45:12) 2002, pp 45-49.

Sviokla, J. "Forget Citibank - Borrow from Bob," in: *The HBR List 2009, Harvard Business Review, January 2009*, 2009.

Tan, Y., Mookerjee, V., and Singh, P. "Social Capital, Structural Holes and Team Composition: Collaborative Networks of the Open Source Software Community," Twenty Eight International Conference on Information Systems, Montreal, 2007.

Wang, J. "The Role of Social Capital in Open Source Software Communities," Eleventh Americas Conferenceo n Information Systems, Omaha, NE, USA, 2005.