Predictive Analysis Using Social Profile in Online P2P Lending Market

Introduction

Online peer-to-peer (P2P) lending markets enable individual consumers to borrow from, and lend money to, one another directly. We study the borrower-, loan- and group- related determinants of performance predictability in an online P2P lending market by conceptualizing financial and social strength to predict borrower rate and whether the loan would be timely paid. The result of our empirical study, conducted using a database of 9479 completed P2P transactions in calendar year 2007, provide support for the proposed conceptual model in this study. The results showed that combing financial files with social indicators can enhance the performance predictability in P2P lending market. Although social strength attributes do affect the borrower rate and status, their effects are very small in comparison to financial strength attributes. This paper concludes with specific suggestions to borrowers and lenders to increase their chances of funding to refunding completely in P2P lending market, and a discussion of future research opportunities.

Methods

Models

In this paper, we study the borrower-, loan- and social- related determinants of performance predictability in an online P2P lending market by conceptualizing financial and social strength to predict whether the borrowers could be funded with lower interest, and the lenders would be timely paid. For this task, a conceptual framework is proposed, then model-based clustering method, discriminate analysis and confirmatory factor analysis was applied by using SAS® 9.3 and SAS® Enterprise Guide on real P2P lending data provided by Prosper.com.

Research Hypothesis

As we conceptualize in the following model and have developed in the previous discussion of important relationship, the conceptual framework indicates that borrower characteristics potentially have effects on loan performance. The following three hypotheses summarize this discussion:

H1: Combining financial factors with social factors can enhance the ability to predict performance in P2P lending market

H2: Social strength is more important than financial strength when predict lenders' performance.

H3: Social strength is more important than financial strength when predict borrowers' performance.

H4: Combining financial strength and social strength factors can distinguish borrowers

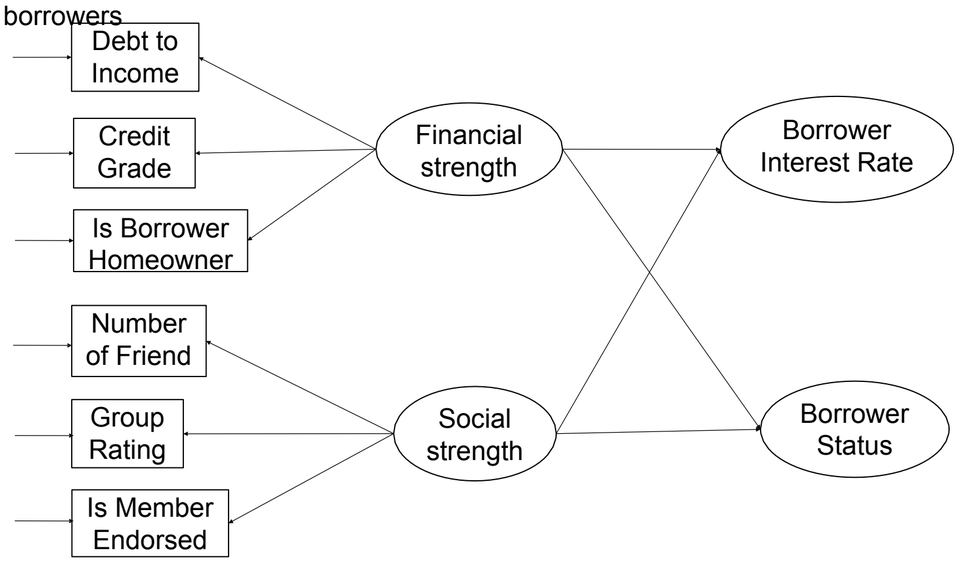
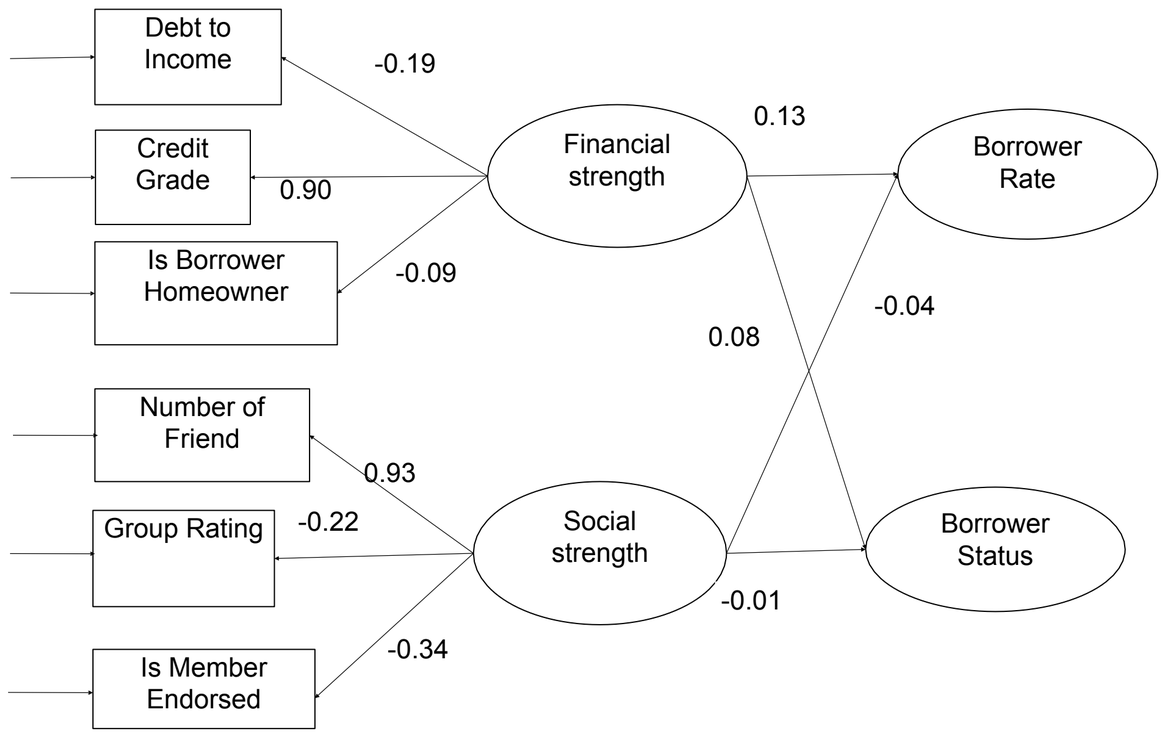


Figure 1. Conceptual Framework in P2P Lending Market.

Results



Conclusion

H1: Combining financial factors with social factors can enhance the ability to predict performance in P2P lending market.

We accept H1, for both financial and social variables are significant for explaining borrowers' status and borrower rate, respectively.

H2: Social strength is more important than financial strength when predict lenders' performance.

We reject H2. In the conceptual model, we can say that financial strength (0.13) is more important than social strength (0.08) when predict borrowers' interest rate.

H3: Social strength is more important than financial strength when predict borrowers' performance.

We reject H3. In the conceptual model, we can say that financial strength (-0.04) is more important than social strength (-0.01) when predict borrowers' status.

H4: Combining financial strength and social strength factors can distinguish borrowers.

We reject H4. In section 5.3, by using discrimination analysis method, borrowers cannot be distinguished only by financial and social strength variables.

Reference

S. Freedman, G.Z.Jin. "Do social networks solve information problems for Peer-to-Peer lending?" Evidence from Prosper.Com-papers.ssrn.com.

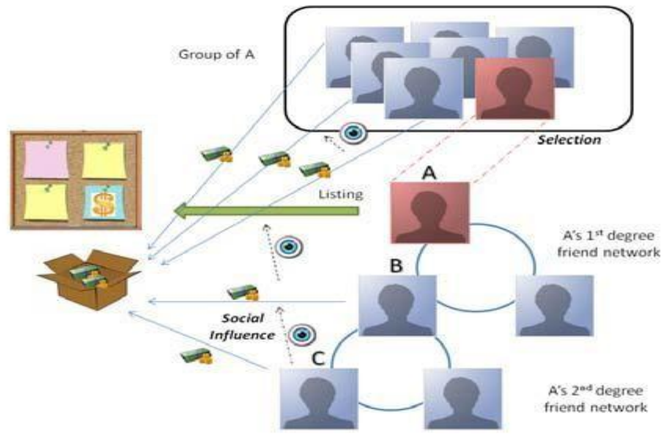
Hampshire, Robert (2008). "Group reputation effect in Peer-to-Peer lending markets: an empirical analysis from a Principle-Agent Perspective." working paper.

Mendelson, Haim (2006). "Prosper.com: A People-to-People lending marketplace." working paper.

Heerero-Lopez (2009). "Social interaction in P2P lending." working paper.

SAS® GLOBAL FORUM

SOCIAL NETWORK IN PROSPER.COM



Data Exploring

The Prosper dataset contains all the transaction and member data since its inception in November 2005. This is a considerable volume of information that encloses approximately (by December2008) 6 Million bids, 900,000 members, 4,000 groups and350,000 listings. In order to facilitate the analysis of the data, the dataset was filtered to contain all the loans created in calendar year 2007 and all the listings created in calendar year 2007, the bids created for these listings, the subset of members that created these listings and bids, and finally, the groups these members are affiliated with.
The following table shows the approx. records available based on the status out of 9479 observations. However, our interest is to predict whether the loan would be timely paid or not. So we will be replacing fully Paid status to “Good”, indicating borrower is a good borrower and for the rest will be replacing to “Bad”, indicating a bad borrower.

Status	Approx. Records
Charge-Off	2465
Defaulted	1153
Repurchased	13
Fully Paid	5848

Status	Approx. Records
Good	5848
Bad	3631

Following table and chart represents the overall distribution of Target variable ‘Status’ with respect to group status (is in a group/ is not in any group). And it is obviously to see that there are more borrowers belong to at least one group in “GOOD” Status.

	GOOD	BAD	TOTAL
ISGROUP	2211	1678	3889
ISNOTGROUP	3637	1953	5590
TOTAL	5848	3631	9479