2014

CREDIT RISK PREFERENCE IN E-FINANCE: AN EMPIRICAL ANALYSIS OF P2P LENDING

Zhensheng Zhang
National University of Singapore, Singapore, Singapore, Singapore, zhang@nus.edu.sg

Follow this and additional works at: http://aisel.aisnet.org/pacis2014

Recommended Citation
Zhang, Zhensheng, "CREDIT RISK PREFERENCE IN E-FINANCE: AN EMPIRICAL ANALYSIS OF P2P LENDING" (2014).
PACIS 2014 Proceedings. 197.
http://aisel.aisnet.org/pacis2014/197

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2014 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
Abstract

Online P2P lending marketplaces match individual lenders and borrowers for unsecured loans via real-time auction without financial institutions as an intermediary. This paper aims to build up a theoretical framework from the perspectives of informational social influence and herding behavior to explain how individual investors’ participation of online financial community influence their credit risk preference in online P2P lending marketplaces under different financial situations. The research proposes that online financial community participants’ credit risk preference is higher than non-participants in investment decision making during non-financial crisis period, whereas online financial community participants’ credit risk preference is lower than non-participants during financial crisis period. This research plans to conduct a field study to test the proposed effect by examining individual investors’ real transaction data on Prosper.com during financial crisis period and non-financial crisis period as well as their membership records on the community of Prospers.org. An analytical model will be further estimated to test the proposition.

Keywords: E-finance, P2P lending, Online P2P lending marketplace, Credit risk preference, Individual investment, Online financial community, Financial situation, Financial crisis, Non-financial crisis.
1 INTRODUCTION

Nowadays, online P2P (Peer-to-Peer) lending transactions have flourished on the Internet, despite the global financial crisis. Online P2P lending marketplaces, such as Prosper.com (www.prosper.com), match individual lenders and borrowers directly for unsecured loans via real-time auction. The emerging financial service may generate significant savings in operation costs, which leads to lower interest rates for individual borrowers and higher returns for individual lenders (Freedman & Jin 2011). Meanwhile, lenders must face credit risk in online P2P lending marketplaces. The credit risk arises from the uncertainty over the borrowers’ repayment cash flow of principal and interest of loans (Morris & Shin 2009). In this study, credit risk refers to the risk of default by individual loan borrowers in online P2P lending marketplaces.

Accompanying with the emergence of P2P lending marketplaces, online financial communities consisting of discussion forums have been built up, such as Prospers.org (www.prospers.org). The community provides a platform for loans borrowers and lenders on Prosper.com to share information, experience and resources with each other. Prior studies show that online community participation may influence individual’s learning process as well as consuming behavior (Algesheimer et al. 2005; Dellarocas 2003; Kozinets 2002; Turkle 2011). Online community participation also affects consumer’s risk-seeking tendency in financial decision making (Zhu et al. 2012). However, less attention has been paid to investigate the effect of individual investor’s community participation on credit risk preference in online P2P lending marketplaces with regards to distinct financial situations.

This paper, responding to the call for research, aims to build up a theoretical framework from the perspectives of informational social influence and herding behavior to explain, under different financial situations (financial crisis vs. non-financial crisis), how individual investor’s financial community participation influence credit risk preference in online P2P lending marketplaces. The research proposes that online financial community participants’ credit risk preference is higher than non-participants in investment decision making during non-financial crisis period, whereas online financial community participants’ credit risk preference is lower than non-participants during financial crisis period. To address the research question, a field study is planned to test the proposed effect by examining individual investors’ real transaction data on Prosper.com and membership records on Prospers.org during financial crisis period (October 2007 to December 2008) and non-financial crisis period (March 2006 to September 2007). By putting forward the theoretical framework and analytical model, this research contributes to the understanding of credit risk preference in the emerging financial marketplaces by a comparison under different financial situations in terms of financial crisis period and non-financial crisis period.

2 THEORETICAL BACKGROUND

2.1 Credit Risk Preference

This study focuses on individual investors’ credit risk preference in online P2P lending marketplaces during different financial periods such as financial crisis period and non-financial crisis period. Credit risk, as a typical financial risk, is closely related to individual investors’ financial decision making (He et al. 2008; Zhou & Pham 2004). Some individual investors exhibit risk seeking preference with willingness to take higher risks for greater rewards, whereas others tend to be risk averse by making safer investment decision to avoid losses. Prior research has shown the evidence that individuals’ risk preference can be significantly affected by social factors such as membership in a group and the group’s cultural values (Sitkin & Pablo 1992). Being group memberships, individuals may prefer higher risk when making decision within the group than alone (Blascovich & Ginsburg 1974; Stoner 1961). Individuals are also found to exhibit risk aversion preference within group (Pilkonis & Zanna 1973). Thus, it has been recognized that the direction of a group’s influence on individuals’ risk preference relies on the risk-taking trends of the group. However, previous studies have paid more attention to general risk preference rather than individual investors’ credit risk preference during financial decision making towards investment of personal loan.
2.2 Informational Social Influence and Herding Behavior

This research tries to give an explanation from the perspective of informational social influence and individual investors’ herding behavior. Informational social influence demonstrates that when individuals cannot make appropriate decisions in ambiguous social situations they attempt to assume that other members within group possess more accurate information and reflect right behavior for a given situation (Aronson et al. 2005). Herding behavior is defined as occurring when individual mimics others, ignoring substantive private information (Scharfstein & Stein 1990). Herding tendencies may emerge as individual imitates others’ actions by judging that others’ actions contain useful information (Keynes 1936; Keynes 1937). Further, individuals may discount private information in favour of information about the actions of the herd (Scharfstein & Stein 1990). With informational social influence in community, the influence of private information on individuals’ decisions is overwhelmed by the influence of public information about the decisions of the community, which leads to individuals’ herding behavior (Baddeley et al. 2007).

3 THEORETICAL FRAMEWORK AND PROPOSITION

The informational social influence in online financial community can manifest itself among members including lenders and borrowers. Lender’s private investment decision in P2P lending marketplaces may be implicitly influenced by other lenders or borrowers in online financial community during financial crisis situation and non-financial crisis situation.

Under the situation of financial crisis, pessimistic information may publicly overwhelm the financial online community as the economic conditions became deleterious. The public information conveyed by the majority of the community turns to be more cautious to make lending decisions and unwilling to loan due to high default rate. Individuals who participate in the online community would be affected by the informational social influence exerted by the herding behavior and mimics other members, such that the individuals are inclined to exhibit lower credit risk preference (i.e. credit risk aversion) than non-participants.

On the contrary, under the situation of non-financial crisis, economic conditions remain healthy and public information in online financial community becomes optimistic. The majority of the community members are more active to take higher risk for greater rewards, which forms the alternative informational social influence within the group. In this case, financial community participants’ private investment decisions would be influenced by the optimistic public information conveyed by surrounding members, which leads to their higher credit risk preference (i.e. credit risk seeking) than non-participants. The theoretical framework of the research is proposed in Figure 1.

As with the above discussion, this study proposes that credit risk preference of investors who participate in online financial community is lower than those who don’t participate in online financial community when they make investment decisions in P2P lending marketplaces during financial crisis period. In comparison, when making investment decisions in P2P lending marketplaces during non-financial crisis period, credit risk preference of investors who participate in online financial community is higher than those who don’t participate in online financial community.
4 METHODOLOGY

4.1 Research Setting

The research collects database of P2P auction loans listed on Prosper.com (www.prosper.com) and membership records on Prospers.org (www.prospers.org). Prosper.com, founded in the United States in 2006, is the world’s largest peer-to-peer lending marketplace with approximately 2.04 million members and $718 million personal funded loans (as of November 2013). The lending marketplace aims to provide platform for individuals to borrow and lend directly to each other without financial intermediaries through peer-to-peer loan auctions. During the loan auction on Prosper.com, borrowers submit amount, maximum interest rate and duration of the loan they want to request. Meanwhile, lenders make corresponding investment decisions according to their own risk preference and borrowers’ credit rates and personal information provided by Prosper.com.

Prosper.com assigns credit rate to each borrower based on verified personal information and relevant documents such as household income, bank accounts, credit score credit-reporting agency and income tax returns, as shown in Figure 2. The credit rate ranges from lowest credit risk to highest credit risk (i.e. AA, A, B, C, D, E, HR), among which AA indicates borrowers’ lowest loan default rate, and HR represents borrowers’ highest loan default rate. With the assigned credit rate on Prosper.com, borrowers post loan requests for auction. Lenders are considered to make lending decisions to take greater credit risk for greater rewards. Accordingly, lenders’ credit risk preference could be operationalized as the degree of risk they take to lend money to borrowers with various credit default rates.

Prospers.org is a free and non-commercial community consisting of discussion forums where borrowers and lenders on Prosper.com can gather to share information, experience and resources relating to personal loan auction. For instance, borrowers participate in the discussion forums to communicate with potential lenders about their credit information, and lenders participate in the discussion forums to share lending strategies and individual loan experience. This research focuses on Prospers.org to examine individual’s financial community participation.
4.2 Field Study

This research plans to conduct a field study with lenders on Prosper.com to test the proposition that online financial community participants’ credit risk preference is higher than non-participants in investment decision making during non-financial crisis period, whereas online financial community participants’ credit risk preference is lower than non-participants in investment decision making during financial crisis period.

The sample of lenders is randomly selected from lenders registered on Prosper.com as of December 2008, and the lenders’ behaviors are tracked from March 2006 to December 2008 which covers global non-financial crisis period (March 2006 to September 2007) and financial crisis period (October 2007 to December 2008) according to the timeline of overall bursting of the U.S. housing bubble. To further check the breakpoint at October 2007, the Chow test will be used in the following regression to determine whether the impacts on distinct samples of the lenders are different. This study estimates a regression model as the following form to test the proposition:

\[
\text{Credit Risk Preference} = b_0 + b_1 \text{Community Participation} + b_2 \text{Financial Situation} \\
+ b_3 \text{Community Participation} \times \text{Financial Situation} \\
+ b_4 \text{Regular Markets Investment} \\
+ b_5 \text{Investment Experience} \\
+ b_6 \text{Education Level} \\
+ b_7 \text{Gender} \\
+ b_8 \text{Age} + \epsilon
\]
Credit risk preference during a single period (non-financial crisis period or financial crisis period) as the dependent variable is calculated by summing lenders’ credit rate of each loan weighted by its share in the lending portfolio during the single period as the following formula:

\[
\text{Credit Risk Preference} = \sum_{i=1}^{n} \text{Credit Risk Rate}_i \times \text{Share}_i
\]

Where \( i \) represents lenders’ each loan during the single period; Credit Risk Rate, is credit rate assigned to each loan; Share, is the proportion of loan \( i \) in lender’s lending portfolio during the single period. The study will collect data from Prosper.com for the dependent variable including 1) percentage of each lending amount on total lending amount during non-financial crisis period or financial crisis period; 2) credit rate to each loan made by lender (i.e., AA, A, B, C, D, E, HR). Accordingly, the average credit risk rates for Prosper rating are 0-1.99% for AA loan, 2-3.99% for A loan, 4-5.99% for B loan, 6-8.99% for C loan, 9-11.99% for D loan, 12-14.99% for E loan, and \( \geq \)15% for HR loan (http://www.prosper.com/invest/how-to-invest/prosper-ratings/). To facilitate calculation, the study employs mean value of each loan type (i.e. 1% for AA loan, 3% for A loan, 5% for B loan, 7.5% for C loan, 10.5% for D loan, 13.5% for E loan, and 15% for HR loan).

This study operationalizes lenders’ community participation as a predictor by examining whether the lender belonged to the community of Prosper.org during non-financial crisis period or financial crisis period (‘1’ as community participation, ‘0’ as community non-participation), and incorporates financial situation period as proposed moderating variable (‘1’ as financial crisis situation, ‘0’ as non-financial crisis situation). The effects of several independent variables are controlled in this study. The lenders may invest on regular markets other than P2P marketplaces. The regular markets investment is considered to impact lenders’ online investment behavior. In this sense, the variable of regular markets investment is measured as the ratio of investment size of regular markets to P2P marketplaces. Investment experience is related to the range of years of investment experience. The lenders with different investment experience may show distinct lending behaviors and credit risk preference even if they are facing the similar scenario. Education level is controlled to represent lenders’ formal education experience from low to high. Lenders’ gender and age will also be collected in the following phase to make the analytical model more comprehensive.

5 LIMITATIONS AND FUTURE RESEARCH

For this study, it is necessary to rule out self-selection bias originated from the fact that lenders who join online financial community prefer higher credit risk than those who do not join during non-financial crisis period, or lenders who join online financial community prefer lower credit risk than those who do not join during financial crisis period. However, it is not feasible to compare lenders’ difference of credit risk preference before and after they join the online financial community because lenders tend to join the online community right after they join the lending marketplace, such that there lacks lending records before lenders join the online financial community. It is also difficult to apply techniques of propensity score matching and instrumental variables to solve the self-selection bias for the reason that no variable is available to affect lenders’ decision to join the online community rather than their credit risk preference.

To this end, a lab study is being planned to test whether participants’ prior credit risk preference determines their joining the online community. The participants will be asked to imagine that they lend on Prosper.com, and trained to access the lending website. Then, Prosper.org as online financial community will be introduced to the participants, and the participants will be asked for their willingness to join the community and the perceived helpfulness of the community. After that, a likert scale will be used to measure the participants’ prior credit risk preference related to financial investment (Carducci & Wong 1998). Then, the study will regress participants’ willingness to join the community on score of prior credit risk preference to test whether prior credit risk preference predicts participants’ perceived helpfulness of the online financial community.
6 CONCLUSION

This research aims to build up a theoretical framework from the perspectives of informational social influence and herding behavior to explain how individual investors’ financial community participation influence credit risk preference in online P2P lending marketplaces under different financial situations including financial crisis and non-financial crisis. The research proposes that online financial community participants’ credit risk preference is higher than non-participants in investment decision making during non-financial crisis period, whereas online financial community participants’ credit risk preference is lower than non-participants in investment decision making during financial crisis period.

The research plans to conduct a field study to address the question. The field study tests the stated proposition by examining individuals’ real transaction data on Prosper.com during financial crisis period (October 2007 to December 2008) and non-financial crisis period (March 2006 to September 2007), and individuals’ membership records on the online financial community of Prospers.org. By comparing the distinct financial situations including financial crisis period and non-financial crisis period, this research puts forward the theoretical framework and analytical model. Accordingly, this research contributes to an in-depth understanding the individuals’ credit risk preference in emerging financial marketplaces.

References


