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Gender Discrimination towards Borrowers in Online P2P Lending

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Abstract：Online peer-to-peer (P2P) lending has developed fast around the world in recent years; however, studies regarding gender discrimination and its rationality for developing countries are limited. Gender discrimination towards borrowers and its rationality in P2P lending in China are studied in this paper. Using data collected from PPdai.com, one of the largest P2P lending platforms in China, we found that, female borrowers are less likely to be funded than male borrowers, but their default rates are lower. Such results suggested that there is significant gender discrimination in P2P lending market in China, but such discrimination is out of prejudice rather than from rational reasoning. Eliminating such gender discrimination is not only beneficial to female borrowers, but also helpful for improving returns of lenders.

Keywords: online peer-to-peer lending, gender discrimination, logistic regression.

1. INTRODUCTION

Online peer-to-peer lending (P2P lending) refers to unsecured loans between lenders and borrowers through online platforms without the intermediation of any financial institutions [1, 2]. It is a new way to lend and borrow money through online platform. It has become popular in China. China has millions of micro-entrepreneurs and rural poor borrowers who may not be able to access finance from traditional sources, which makes it a big market for peer-to-peer groups. In China one of the well-known companies is Ppdai, which was built in 2007 and now has attracted over 500,000 customers by the end of 2012.

In the online P2P lending both borrowers and lenders have to register in the platform. Borrowers could post a loan request, and then lenders could review the loan requests and determine which ones to fund. Such lending could take place between borrowers and lenders who never know each other, so it is fast and easy to make a deal, which attracts many low-income individuals who need a small amount of loan.

In the credit lending market, female-owned small enterprises tend to be less likely to receive loans from banks and pay higher interest rates than male-owned enterprises. In the labor market, such discrimination still exists. Barasinska[3] proves that there are gender difference in lending behaviors in the P2P lending market. Carter et al.[4] further showed that different relative importance will be attached to loans between male and female lenders. Due to gender discrimination, women are less likely to access financial resources and hence be in economically disadvantaged positions in society. Such phenomenon is especially prominent in less developed countries, which presents a significant problem for anti-poverty. In order to provide necessary financial aids to those in need, we should have a clear picture of what extent gender may influence their accessing financial resources. The emergence of P2P lending allows us to have the opportunity to empirically examine this issue. Therefore, the goals of the paper are the following:

(1) Examine whether there is any significant gender discrimination in seeking loans in developing countries.
(2) If such discrimination exists, whether such discrimination is rational.

2. RESEARCH METHODS

Logistic regression model was used to test the existence of gender discrimination. Each borrowing listing is regarded as an observation. We also use logistic regression to analyze the rationality of gender discrimination. The dependent variables defined as 1 if a loan defaults and 0 otherwise. The independent variable includes two folds: information of borrowers and information of loans.

The research data all comes from Ppdai, which is one of the leading online p2p platforms in China. The operation procedure of Ppdai resembles to Prosper which is the leading online p2p lending platform in US. Ppdai mainly serves low-income individuals and small business groups, including the individual small business owners, college students and ordinary company staffs who need small amount loans and can't get loans from banks easily. And in the past few years Ppdai has developed more than 500,000 members.

3. RESULTSOF DATA ANALYSIS

In order to analyze the gender difference and test the hypotheses, the results of descriptive analysis are displayed in table 2.   As the results show, there are 20690 observed samples in the success model and 3555 in the default model. It also reveals that there are more than 80% male borrowers, which means online P2P lending is still a men dominant market. It is the first evidence for the gender difference in the online P2P market. Then there should be some disadvantages for women. The discussion will be displayed in the next section.

Table 1. Descriptive analysis

Gender	Success			Default		
	0	1	percent	0	1	percent
1(men)	9278	8106	84.02	2877	89	83.43
2(women)	1689	1617	15.98	566	23	16.57

Then, to make a better understanding of the gender difference and how the relation is, the data was fed into the logistic regression model.   The results are showed in table 3, table 4and table 5.

Table 2. Test the existence of gender discrimination

Parameter	DF	Estimate	Standard Error	Pr>ChiSq
Intercept	1	1.6976***	0.1368	<.0001
BorrowingAmount	1	0.000032 ***	2.935E-6	<.0001
Gender	1	-0.0916*	0.0506	0.0702
Age	1	-0.0105***	0.00408	0.0100
Education	1	-0.1175 ***	0.0166	<.0001
Marriage	1	-0.0890*	0.0469	0.0577
FriendNumber	1	-0.0260***	0.000754	<.0001
Pseudo-R^2		12.6%		
Number of obs.		12424		

Note: *, ** and *** indicate the 0.10, 0.05 and 0.01 levels of significance. The dependent variable is Boolean value indicating whether a borrow listing is fully funded.

As shown in table 3, the impact of gender on funding success is significant (b=-0.0916, p<0.10). The Pseudo-R^2 is 12.6%, meaning a significant amount of variance is explained by independent variables. The above findings suggest that there is significant gender discrimination in loan seeking process, thus H1 was supported.

Table 4 showed that the impact of gender on loan default is significant (b=-0.5531, p<0.05). The Pseudo-R^2 is 7.8%. Such results implied that after controlling the covariates, the default rate for female borrowers is

significantly lower than their male counterpart. In contrary to our hypothesis, the female borrowers are more reliable than male borrowers. Thus H2 was rejected.

Table 3. Test the rationality of gender discrimination

Parameter	DF	Estimate	Standard Error	Pr>ChiSq
Intercept	1	2.6145***	0.9999	0.0089
BorrowingAmount	1	0.000049	0.000033	0.1409
Gender	1	-0.5531 **	0.2724	0.0423
Age	1	0.0171	0.0314	0.5865
Education	1	-0.2248 *	0.1155	0.0515
Marriage	1	0.4786 *	0.2837	0.0916
FriendNumber	1	0.0220***	0.00545	<.0001
Pseudo-R^2		7.8%		
Number of obs		1873		

Note: *, ** and *** indicate the 0.10, 0.05 and 0.01 levels of significance. The dependent variable is a Boolean value indicating whether a loan defaults.

The odds ratio estimates are shown in table 5 to have a clearer picture of how gender affects funding success and loan defaults. It showed that the funding rate is 9.8% lower for female borrowers than for male borrowers, but the default rate is 43.5% lower for female borrowers than for male borrowers.

Table 4. Odds ratio estimates

Effect	Point Estimate	
	Default	Success
BorrowingAmount	1.000	1.000
Gender	0.575	0.912
Age	1.017	0.990
Education	0.799	0.889
Marriage	1.614	0.915
FriendNumber	1.022	0.974

5. DISCUSSIONSAND IMPLICATIONS

The data of transaction about borrowers is collected from Ppdai online peer-to-peer platform. We used the logistic regression to analyze the gender difference in borrowing rates and default rates of borrowers. The result of data analysis suggests the existence of gender discrimination in the online p2p lending market. Despite of the good performance on the default rates, women still don't get more loans.

Although female borrowers are very hard to get loans in the P2P lending market, they are more reliable than male borrowers. The result showed that the default rate of female borrowers ismuch lower than that of male borrowers. It means that the gender discrimination is caused mainly by prejudice rather than by rational analysis. Such discrimination is not only harmful to female borrowers in the market, but also harmful to the market efficiency and social welfare. Lenders may wrongly pick male borrowers who are more likely to default.

The reason that default rate for female borrowers is lower may be that they have less opportunities to seek loans in developing countries such as China, so they cherish any chance of getting loans. Only if female borrowers can keep good credit records, they can have chances to borrow again in the future. As a result, it is beneficial for people to lend to female borrowers.

Such results entail strong managerial implications. Because of gender discrimination, some good quality female borrowers who are in need of money and are credible to repay loans are not eligible to access loans. Such discrimination is irrational and may cause loss of social welfare. In order to improve market efficiency, policy makers should be fully aware of the existence of gender discrimination in the lending market and provide necessary actions to eliminate such discriminations. For lending platforms, they should inform lenders that female borrowers are also reliable and investing in female borrowers is beneficial.

Such results also entail research implications. Although gender discrimination is a hot topic and was widely studied in a number of fields; there have been limited studies in the field of lending market, especially for developing countries. Due to the fact that financial institutions are less mature in developing countries and females are in a social economically disadvantaged position, providing financial services to female borrowers are especially important. This study not only confirms the existence of gender discrimination, but also explores the rationality behind such discriminations. The current research extends the previous research that gender discrimination is the result of social prejudice and could do harm not only to female borrowers, but also to the lenders themselves. Such results could enrich our understanding as to the causes of gender discrimination and its effect. Such results may also be useful to the development of gender discrimination theories and come about measures to tackle it.

6. CONCLUSIONS

Gender discrimination of borrowers and its rationality in P2P lending are studied in this paper. Using data collected from PPdai.com, one of the largest P2P lending platforms in China, we found that, female borrowers are less likely to be funded than male borrowers, but their default rates are lower. Such results suggested that there is significant gender discrimination in P2P lending market in China, but such discrimination is out of prejudice rather than from rational reasoning. Eliminating such gender discrimination is not only beneficial to female borrowers, but also helpful for improving returns of lenders.

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