

**Is Social Media Part of the Solution to Our Financials?
Antecedents and Consequences of Using Social Media for Personal Finance**

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Abstract

Personal finance is crucial to people's life quality. The public has been searching solution to help improve personal financial literacy and personal finance ability. This study is intended to find out whether those who have used social media for personal finance initially believed that social media could be part of the solution for its usefulness in personal finance, whether users are satisfied with their such use, as well as whether such use becomes part of the solution by leading to improved personal finance outcomes and higher satisfaction with personal financials.

This empirical study used survey data. A total of 410 people responded to an online questionnaire survey. With a structural model, this study analyzed the data of those 359 individuals who reported that they have used at least one of various online or/and social media tools to view, learn, post, or ask for financial information or advices. SmartPLS was used in data analysis.

The results show that

- Antecedents: usefulness and compatibility are the two major factors that attract people towards using social media for personal finance. Easiness and concerns/risks are not significantly related. These findings suggest: people have looked for the usefulness of social media for personal finance when they choose to adopt, but a more important factor for their adoption is whether their skills and abilities are compatible with the social media.
- Consequences and Outcomes: The use of social media for finance does lead to customer satisfaction towards such use. But more importantly, the use of social media for personal finance leads to positive outcomes such as "social media help me approach personal finance", "social media improve my ability in dealing with personal finance", "social media increase my knowledge of personal finance", "social media provide me access to personal finance advice". These findings suggest: users are satisfied with such use, and social media becomes part of the answer by leading to improved personal finance outcomes.
- Future use: It is the positive outcomes that prompt users' intention to continue use social media for personal finance in the future. The use of social media itself, and user satisfaction of such use do not necessarily lead to the intention towards continuing use it in the future.

Implications and limitations are discussed.

Introduction

Personal finance involves all financial decisions and activities of an individual or household. People will not be able to choose the right savings, borrows or investments for themselves, if they are not financially literate. The 2008 financial crisis had an impact on household finances over the world. Personal finance is one of the most important aspect of people's lives. However, the study by the Standard & Poor's found that about 67% of adults worldwide lack a basic understanding of financial concepts (Griffin, 2016). The solution has been searched to help improve personal financial literacy and personal finance ability. Social media is a new forum that allows people to exchange idea, collaborate, and share information. Not just younger generations, individuals of all ages are now actively sharing their thoughts, ideas and opinions online. Social media has not only changed the way people communicate with one another, it has also influenced politics, business, world culture, education, careers and more. Personal finance also cannot be exempted from that trend. With the evolution of the technology, learning has become a mobile activity, which can be just a click and swipe. Because the younger generation prefers the use of social media for information gathering, social media has become the preferred choice to educate and interact with them about personal finances. Many financial institutions have begun to focus on providing educational programs that incorporate a wide range of social media platforms in order to reach consumers who are interested in learning more about their personal finances. A 2015 study also reveals that 57% of millennials prefer to use financial mobile apps to manage their finances (Griffin, 2016). According to another survey, which assessed 4,000 investors with more than \$100,000 in investible assets, about 34% of affluent investors use social media such as Facebook, LinkedIn, twitter and company blogs for personal finance and investing purposes (Skinner 2013).

The impact of the social media on personal finance has attracted researchers' attentions. A 2012 study by the MIT media lab at the Massachusetts Institute of Technology found that people sourcing investment ideas from social-networking sites boosted returns. They gave \$20 trading coupons to 500 active financial traders. Returns were increased more than 10% compared to those who traded without guidance from the social network, and 4% higher than those who only followed the highest-performance gurus (Bokov, 2016). However, the openness and lack of regulations inherent in social media outlets can be used by some users to spread false "information" and mislead people. It is unclear that whether the social media would be the solution to improve personal finance. To answer the question, this study tries to identify the antecedents and consequences of using social media for personal finance. We find that the perceived usefulness of using social media for personal finance and compatibility--whether people's skills and abilities are compatible with social media, are the two important factors that attract people toward using social media for personal finance. The use of social media does improve the personal finance, which brings people high satisfaction of using social media for personal finance.

The plan of this paper is as follow. In section two, we review the corresponding studies and develop the hypotheses for this research. In Section three, the research methodology is described. Section four provides the data analysis. This is followed by the discussion in Section five. The conclusions and implications are presented in Section six.

Literature Review and Hypothesis Development

Social media, such as Facebook, LinkedIn, Twitter, YouTube, and blogs, is a fundamental for individuals for social interaction, information seeking, information sharing, entertainment, relaxation, communication, and expression of opinion, etc. (Whiting & Williams 2013). Recently, Social media has become a popular tool for individuals to manage personal finances. As of 2013, one-third of investors are using social media platforms for personal finance and investing (PF&I) purposes, and nearly 70% have reallocated investments based on content found through social media (Cogent Research 2013). However, the literature regarding the use of social media for personal finance is limited (Way et al. 2011). A few studies investigated the interactions about personal finance on blogs and Internet discussion forums (Hazari & Richards 2011, Way et al. 2011). Willingham (2013) examined the effect of using social media in a financial literacy campaign. Some studies examined the influence of using social media for personal

finance on future stock returns (Chen et al. 2014), individuals' investment decisions (Mudholkar & Uttarwar 2015, Ammann & Schaub 2017), and traders' disposition effect (Heimer 2016). Nevertheless, empirical research about the antecedents and consequence of how people using social media for personal finances is still lacking.

The Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI) theory are two popular ways to explain the adoption and usage of information technologies (IT) (Taylor & Todd 1995a). These two theories provides theoretical basis for the use of social media for personal finance and investing. As a powerful way to represent the antecedents of technology usage, the TAM proposes that the perceived ease of use and the perceived usefulness of a technology lead to its acceptance by users (Davis 1989, Taylor & Todd 1995, Lee et al. 2003, Legris et al. 2003). The DOI theory suggests that five perceived characteristics of an innovation influence adoption: relative advantage, compatibility, complexity, observability, and trialability (Rogers 1983, Moore & Benbasat 1991, Taylor & Todd 1995a).

Antecedent factors of the use of social media for personal finance

Perceived usefulness is defined as "the degree to which a person believe a particular system would enhance his or her job performance" (Davis 1989, p320). Individuals use social media for personal finance & investing because they believe social media can help them in many ways (Openshaw 2014). Through social network, investors can easily find a financial professional's biographical and professional information and the review and comments on the professional's service, and can contact with the professional through Facebook, LinkedIn, and other social media. Social media can also help investors learn necessary skills for managing finances and making financial and investment decisions. For example, Seeking Alpha is one of the largest finance-related social-media websites in the united states, and it provides market news, stock ideas, portfolio management, marketing forecasts, investing strategies, and earnings reports, transcripts and filings, so that individual users and viewers can make their personal and professional financial decisions after leveraging the breadth and depth of the contents on Seeking Alpha (Chen et al. 2014, Seeking Alpha 2018). Thus, H1 is proposed.

H1: Perceived usefulness of social media has a positive effect on the use of social media for personal finance.

Perceived ease of use is another important factor in the TAM that influences the usage of technologies. Perceived ease of use refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis 1989, p320). Lane (2012) studies perceived ease of use and usefulness of social media for university students in the US, and find that perceived ease of use of social media is positively related to the intensity of use of social media. With the development of social media technologies, learning and managing personal finance can be just a click, swipe or tap away (Griffin 2016). Users can easily look up financial information using social media sites and can receive financial education directly from experts through social platforms. Live streaming apps on mobile devices allow users to interact with others and discuss about finances, and help them mange their finances in real-time and no matter where they are. Thus, H2 is proposed.

H2: Ease of use of social media has a positive effect on the use of social media for personal finance. The extent of social media use for personal finance depends not only on its perceived usefulness and ease of use, but also on the negative factors such as users' privacy and security concerns about social media. It is easy to join and extend social network, but many social media sites lack of basic security measures (Gross & Acquisti 2005). The third parties can easily access participants' data without the social network site's collaboration. For example, in the recent Facebook-Cambridge Analytica data misuse scandal, Cambridge Analytica gained access to private information on more than 87 million Facebook users (BBC 2018). The private information included users' identities, friends, groups, and "likes". In addition, social media users are facing serious security threats, one of which, phishing attacks have caused direct and indirect financial loss of users (Chen et al. 2011). These perceived risks and challenges keep individuals from moving towards greater adoption of social media in personal finance. Thus, H3 is proposed.

H3: Perceived risks factor of social media has a negative effect on the use of social media for personal finance.

Based on the DOI theory, compatibility is “the degree to which the innovation is perceived as consistent with the existing values, past experiences, and needs of the potential adopter” (Rogers 1983, p223). Compatibility has been considered as an important factor for social media adoption (Ainin et al. 2015, Odoom et al. 2017, Wamba & Carter 2016, Zolkepli & Kamarulzaman 2015). When social media is considered as compatible with the way individuals use technologies and manage personal finance, individuals are more likely to consider the adoption of social media for personal finance & investing. For instance, individuals can use email accounts or phone numbers to access Facebook for participating in discussions about stock choices and interacting with other investors or financial professionals. Thus, H4 is proposed.

H4: Compatibility of social media has a positive effect on the use of social media for personal finance.

Social media use for personal finance and the consequences

The use of social media for personal finance brings about a variety of outcomes (Cao & Liu, 2017). Social media platforms increase users’ engagement in personal finance. For instance, social media platforms allow users to interact with each other directly and provide immediate feedback on financial professionals, financial products, and the business performance of related companies (Openshaw 2014). In addition, social media platforms provide more efficient financial education, and allow users to receive financial education directly from financial professionals in a fast and easily digestible way and without the limit of time and location (Griffin 2016).

Because of the efficiency and effectiveness of social media in personal finance, users become satisfied with the guidance and financial advices on personal finance provided by social media, and they would like to make personal finance & investing decisions based on peer opinions from social media platforms. Chen et al. (2014) analyzes articles published on one of the most popular social-media platforms for investors in the US, and finds that investor opinions distributed through the social media is related to future stock returns and earnings surprises. Mudholkar & Uttarwar (2015) argues that social media can influence individuals’ investment decisions. Heimer (2016) compares trader activity before and after exposure to new social trading platform and finds that the magnitude of a trader’s disposition effect-the tendency to sell winning assets, while holding onto losers-is almost doubled after accessing to the social network. Ammann & Schaub (2017) suggests that the comments posted on a social trading platform by traders encourage followers to replicate investment decisions of traders. Thus, H5, H6, and H7 are proposed.

H5: The use of social media for personal finance is positively related to users’ satisfaction.

H6: The use of social media for personal finance is positively related to users’ outcomes.

H7: The outcomes of using social media for personal finance are positively related to users’ satisfaction.

Future use of social media in personal finance

Once users have adopted social media for personal finance, their experiences in using social media for personal finance & investing may enable them to continuously and increasingly use social media in the future. Experiences of using IT tools help users gain extensive knowledge and technology skills, which in turn help shape intention to use the IT tools in the future (Taylor & Todd 1995b, Lee et al. 2003, Legris et al. 2003). In addition, users’ experiences in using IT tools stabilize behavioral intention-behavior relationship (Taylor & Todd 1995b). As a consequent, users are going to use those IT tools in the future. Once users have used social media, their experiences of using social media have enabled them to accept and use it in the future (Parra-López et al. 2011). The experience acquired from using social media for personal finance can strengthen users’ perception of usefulness and easy to use and reduce the perception of risks, thus favoring future use.

Moreover, with the accumulated experiences in using social media for personal finance, users have established related knowledge base and technology skills, and consequently can use social media effectively and efficiently in personal finance. Users have greater ability to manage their personal finances and become more confident in making investment decisions. And thus social media help users approach their personal finance goals and generate greater satisfaction with their use of social media for personal

finance. As a result, users continue to use social media for financial purposes and learn new skills to handle personal finance in the future. Thus H8, H9, and H10 are proposed.

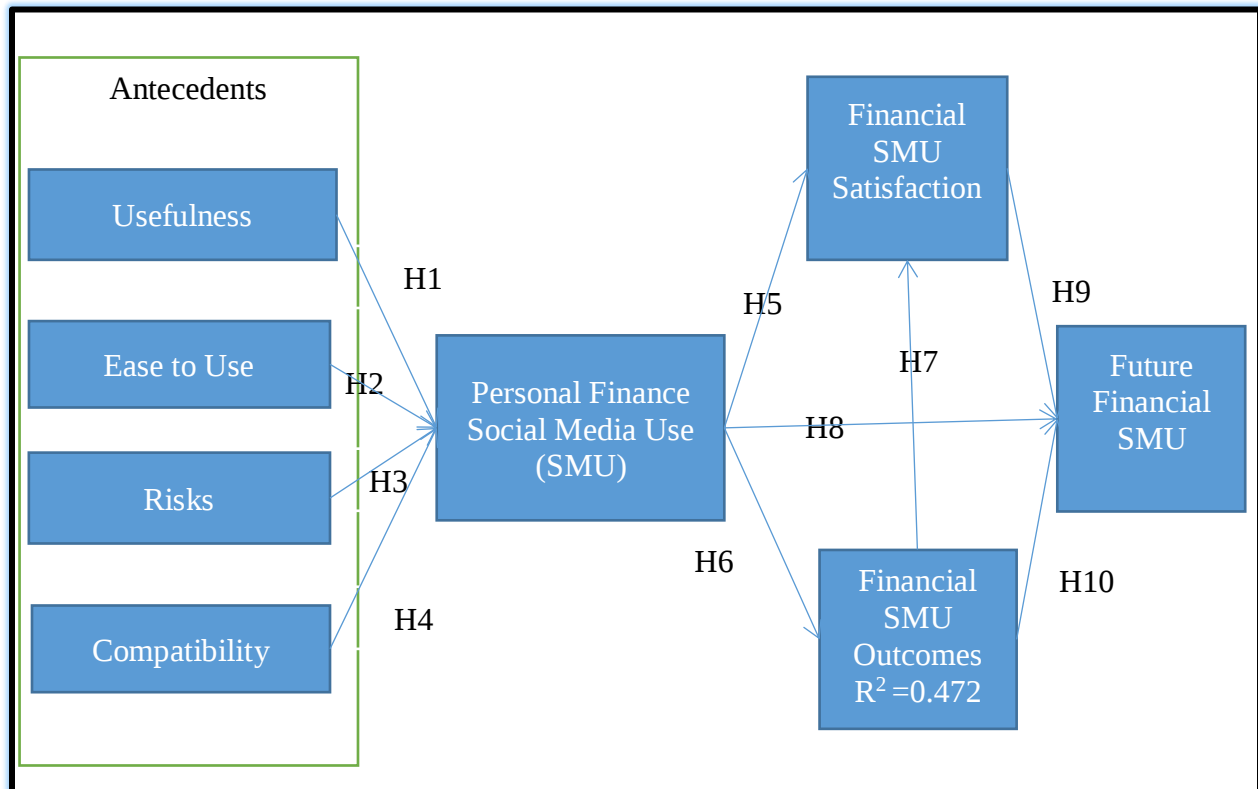
H8: The use of social media in personal finance is positively related to users' such use in the future.

H9: Users' satisfaction with the use of social media for personal finance is positively related to their use of social media for personal finance in the future.

H10: The outcomes of using social media in personal finance are positively related to users' such use in the future.

Figure 1 shows the theoretical model that guides this research.

Figure 1: Research Model for Social Media Use for Personal Finance



Research Methodology

Constructs and research instrument

The study adopted questionnaire survey to collect data. The survey included questions around the antecedents and consequences of social media use for personal finance as well as questions about current social media use for personal finance, as shown in Figure 1. Questions on individual perception of social media use for personal finance are mostly adopted from studies on technology adoption, adding specifics for social media regarding personal finance. The consequences of social media use for personal finance included the outcomes of social media use and satisfaction with social media use for personal finance, as well as future use questions. These questions are mostly based on literature review in the previous section of this research regarding social media use as well general technology adoption. Table 1 shows all the constructs along with the items used for each construct (see Table 2).

**Table 1: Survey Constructs, items, and Summary of Factor Outer Loading:
The Social Media Utilization for Personal Finance Model**

Construct	Items	OL: Outer Loading	OL: Standard Error	OL: T Value
Social Media Use (Legris, Ingham, & Collette, 2003)	1. I spend a lot of time reading blogs on personal finance and/or investment	0.860	0.023	37.893
	2. I frequently visit social media sites/apps on managing personal investments.	0.924	0.011	81.174
	3. I spend a considerable amount of time looking for financial advice through various social media sites.	0.917	0.012	76.236
	4. I have learned financial knowledge using social media sites.	0.891	0.014	63.511
	5. Social media has influenced my decisions in financial planning	0.877	0.017	51.17
Usefulness (Davis, 1989)	1. I think social media can help me access information about personal financial advices.	0.892	0.014	63.469
	2. I think social media can help me find personal finance financial experts.	0.849	0.026	33.186
	3. I think social media can help me learn the necessary skills to manage my finances.	0.927	0.008	113.664
	4. I think social media can help me accomplish my financial goals.	0.850	0.024	34.862
Ease (Davis, 1989)	1. I think it is easy to look up financial information using social media sites.	0.906	0.014	65.084
	2. I think it is easy to access personal finance information through social media sites.	0.899	0.015	61.284
	3. I think it is easy to interact with others and discuss about my finances through social media sites.	0.860	0.02	42.457
Risk	1. I have privacy concerns when using social media to discuss my finances.	0.964	0.013	72.723
	2. I have security concerns when using social media to discuss my finances.	0.977	0.008	128.292
Compatibility (Rogers, 1995; Taylor & Todd, 1995)	1. I think using social media fits well with the way I handle my finances.	0.942	0.010	94.28
	2. I think using social media fits well into my financial planning style.	0.951	0.010	91.896
	3. I think social media applications will be compatible with the way I handle my finances.	0.944	0.009	105.137
Outcome (Way et al., 2011)	1. Social media help me approach personal finance.	0.953	0.009	109.616
	2. Social media improve my ability in dealing with personal finance.	0.956	0.007	140.036
	3. Social media increase my knowledge of personal finance.	0.934	0.009	109.88
	4. Social media provide me access to personal finance advice.	0.943	0.010	96.916
Satisfaction	1. I am satisfied with the guidance provided by social media on personal finance.	0.927	0.011	85.361
	2. I am satisfied with social media financial advices.	0.910	0.014	65.722

Future Use (Taylor & Todd, 1995)	1. I plan to use or continue to use social media for personal financial purposes in the future.	0.951	0.009	106.295
	2. I plan to use or continue to use social media to learn new skills to handle personal finance.	0.952	0.008	116.05

****p<0.1, **p<0.05, ***p<0.001***

SmartPLS, mean replacement, 500 samples, t –statistics results

Subject and procedures

To develop the survey questionnaire to address our research questions on the antecedents and outcomes of using social media for personal finance, the relevant literature on technology adoption, technology acceptance models and the diffusion of innovation theory were reviewed. After the literature review, qualitative data were collected.

The survey was conducted online through SurveyMonkey during October 7 to November 6, 2013. The link to the survey was sent to a group of 50 business undergraduates and in turn forwarded to their classmates, friends, and relatives. A total of 410 people responded to the survey. Among the respondents, 359 people reported that they have used at least one of various online or/and social media tools to view, learn, post, or ask for financial information or advices. The social media tools include several categories: a) Social networking sites (e.g. Facebook, MySpace, LinkedIn, etc.), N=211; b) Blogs, Wiki, Micro-blogs Twitter on finance, N=83; c) Online videos and audios, such as podcasts (e.g. from iTunes, YouTube, Skype, etc. on finance), N=110; d). Online financial newspapers, broker websites, bank customer services, N=126; e) Online finance organizing/planning, expense tracking, and investment help sites (e.g. Pinterest, Geezeo, Wesable; BillMonk, Obopay; Covestor, Tradeking, etc., N=79); Online banking and/or smartphone applications money/investment management, N=157). The demographic information of the respondents is as follows.

Table 2: Respondent Profile (Total N=359)

<i>Demographic profile</i>		<i>N</i>	<i>%</i>
Gender	Male	191	53.20%
	Female	164	45.68%
	Other	4	1.11%
Age	25 and under	165	45.96%
	26-30	70	19.50%
	31-35	34	9.47%
	36-45	42	11.70%
	46-55	37	10.31%
	56 and above	11	3.06%
Marriage Status	Married	101	28.13%
	Single/Other	258	71.87%
Highest Academic Degree	High school	152	42.34%
	Associate degree	46	12.81%
	Bachelor's degree	101	28.13%
	Master's degree	46	12.81%
	First professional and Doctoral degree	6	1.67%
	Other	8	2.23%
Race	American Native	10	2.79%
	Asian	89	24.79%
	Black or African American	15	4.18%
	Caucasian	114	31.75%
	Hispanic or Latino	115	32.03%
	Other	16	4.46%

Data Analysis

Measurement Model

To answer our research questions, the authors we used SmartPLS (Ringle, Wende, & Will, 2005) to validate and test the path and measurement models created. The question items are loaded on 12 factors with all directly mapped to the theorized constructs. Table 1 shows the items, with all of them of a loading above 0.8.

Analysis of the measurement model

We used SmartPLS (Ringle, Wende, & Will, 2005) to validate and test the path and measurement models created. Table 3 presents descriptive statistics and correlations among the constructs. The cross loading of items was minimal. The analysis shows that the measure model had sound convergent validity, discriminant validity, and internal consistency. Average variance extracted (AVE) of the measures ranged from 0.880 to 0.952, which exceeded the recommended minimum of 0.5 (Gefen & Straub, 2005). The

square roots of the AVEs were higher than the cross-construct correlations, which demonstrated acceptable convergent and discriminant validity. In addition, Cronbach's alpha for all constructs exceeded 0.9 (0.7 is often used as the threshold), and the composite reliability of all constructs exceeded 0.8 (0.7 is often used as the threshold), indicating a good internal consistency.

Table 3: Correlations and Reliability/Validity Statistics

	1	2	3	4	5	6	7	8
1SM PF Use	-							
2Usefulness	0.458	-						
3Ease	0.402	0.686	-					
4Risk	-0.181	-0.038	-0.096	-				
5Compatability	0.623	0.595	0.65	-0.191	-			
6 Satisfaction	0.495	0.475	0.524	-0.198	0.559	-		
7 Outcomes	0.687	0.589	0.604	-0.178	0.738	0.616	-	
8Future Use	0.628	0.582	0.566	-0.147	0.714	0.579	0.852	-
Composite Reliability	0.937	0.903	0.867	0.939	0.941	0.903	0.947	0.896
Cronbachs Alpha	0.952	0.932	0.918	0.970	0.962	0.954	0.962	0.950
AVE	0.799	0.775	0.790	0.942	0.894	0.911	0.863	0.906
SQRT (AVE)	0.894	0.880	0.889	0.971	0.946	0.954	0.929	0.952
R ²	0.410					0.389	0.472	0.734
Q ²	0.304					0.336	0.381	0.635

Structure equation modelling

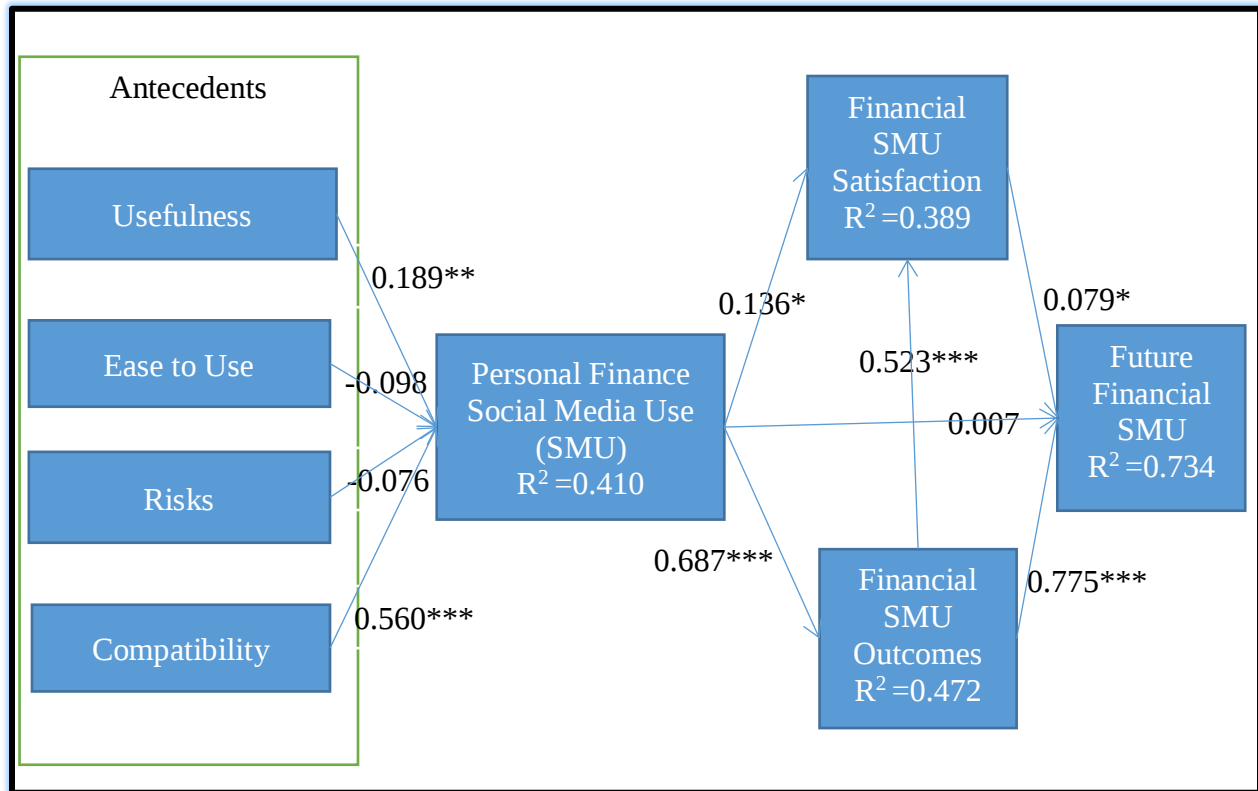
SmartPLS was used to test the hypotheses and evaluated the structural model of this study. SmartPLS fits the needs of a predictive-causal analysis of this study (Chin & Newsted, 1995; Wold, 1982) and it requires fewer data specification constraints as this study borrowed measurements from other study. The analysis used PLS algorithm, blindfolding and bootstrap functions, and a resampling method of 500 samples (Calantone et al., 1998; Chin, 1998b) for SmartPLS.

The estimated regression coefficients of the path analysis for the structural model and their significance levels are presented in Figure 2 below. All of the paths coefficients, except three, are statistically significant and in the expected direction. First, usefulness has a significant and positive relationship with social media use for personal finance (coefficient = 0.189, $p < 0.01$), indicating that H1 is supported. Ease of use (coefficient = -0.098, $p > 0.05$) and perceived risk (coefficient = -0.076, $p > 0.05$) do not have significant relationship with social media use for personal finance, indicating that H2 and H3 are not supported. Compatibility has a significant and positive relationship with social media use (coefficient = 0.560, $p < 0.001$), indicating that H4 is strongly supported. Fifth, social media use for personal finance positively leads to consumer satisfaction with such use (coefficient = 0.136, $p < 0.05$) and actual financial outcomes (coefficient = 0.687, $p < 0.001$). Thus, H5 and H6 are supported. However, social media use for personal finance does not seem to lead to customer's intention of using social media for personal finance in the future (coefficient = 0.007, $p > 0.05$) Thus, H7 is not supported. Additionally, the outcome of social media use for personal finance is positively related to their satisfaction with such use (coefficient = 0.523, $p < 0.001$), thus supporting H8. Lastly, both the outcomes (coefficient = 0.079, $p < 0.05$) and satisfaction (coefficient = 0.775, $p < 0.001$) with using social media for personal finance are positively related to consumer intention to use social media for personal finance in the future. H9 and H10 are thus supported. Therefore, we conclude that all hypotheses, except three, are corroborated by this study.

To further examine the robustness of the study, the data analysis also investigated the explained variability and predictive relevance of the structural model. Table 3 shows the indices for the explained variability (R^2) and the Q^2 test for predictive relevance (redundancy). The results show that the structural model of the study has achieved good R^2 values for its endogenous variables, 0.304 for social media use, 0.336 for satisfaction, 0.381 for outcomes, and 0.734 for future use of social media for personal finance. In

addition, the analysis used Q^2 test for predictive relevance (redundancy) to measure the quality of the structural model (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). The results showed that the Q^2 values are all positive, which suggests that the research model has predictive relevance. The Q^2 values are 0.304 for social media, 0.336 for satisfaction, 0.381 for outcome, and 0.635 for future use of social media. They indicate that the observed values may be well reproduced by the model and its parameter estimates (Real et al., 2006).

Figure 2: Structural Equation Analysis Results



* $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$

Discussions

The results of the structural equation model analysis showed that the research model is well-grounded. The factors of individual perception of using social media for personal finance in the model accounted for 41.0% of the variance in the use of social media for personal finance. The model also accounted for 47.2% of the variance in the reported outcomes of using social media for personal finance, 38.9% of the variance in the reported individual satisfaction with using social media for personal finance, and 73.4% of the future use of social media for personal finance.

Antecedents and Social Media Use for Personal Finance (H1-4)

As for antecedents of using social media for personal finance, the structural equation modeling analysis results show that not all of the paths between technological adoption factors and social media use for personal finance are statistically significant. The perceived usefulness of using social media for personal finance is shown to have a positive relationship with using social media for personal finance (coefficient = 0.189, $p < 0.01$). This result is similar to what research reports about perceived usefulness of social media in general and about actual usefulness of social media for finance in particular (Chen et al. 2014, Seeking

Alpha 2018). Compatibility is the strongest factor associated with social media use for personal finance among the four user perception factors ($\beta = 0.560$, $p < 0.001$). Different from others' research about social media adoption (Lane 2012), perceived ease of use ($\beta = -0.098$, $p > 0.05$) does not seem to have a strong relationship with social media use for personal finance. Despite reports about security, privacy, and other problems (Chen et al. 2011, Gross & Acquisti 2005), perceived risk of use of social media ($\beta = 0.076$, $p < 0.05$) does not seem to have a significant relationship with social media use for personal finance. This confirms findings about the lack of relationship between perceived risk and using social media in organizations (Cao, Ajjan, Hong 2018) and in college teaching (Cao, Ajjan, Hong 2011).

Social Media Use for Personal Finance and the Consequences (H5-7)

The structural equation analysis also confirms the findings of Openshaw (2014), Heimer (2016), and others (Mudholkar & Uttarwar 2015) on the relationships of the use of social media for personal finance and the consequences of such use. First of all, social media use for personal finance has very significant and positive relationship with user reported outcomes ($\beta = 0.687$, $p < 0.001$), such as improve ability in dealing with personal finance, increase knowledge about personal finance, access to personal finance advice, and help in approaching personal finance. Second, using social media for personal finance is positively related to users' satisfaction of using social media for finance ($\beta = 0.136$, $p < 0.05$). In addition, the reported outcomes of using social media for personal finance have a strong relationship with user's satisfaction as well ($\beta = 0.523$, $p < 0.001$).

Consequences and the Future Use of Social Media for Personal Finance (H8-10)

For the future use of social media for personal finance, the analysis shows that it is strongly related to individual reported outcomes of their current use of social media for personal finance ($\beta = 0.775$, $p < 0.001$). It is also related to their satisfaction with the use of social media for personal finance ($\beta = 0.079$, $p < 0.05$). These findings are in accord with Taylor & Todd's (1995b) and Parra-López et al.'s (2011) finding about IT use. However, different from general IT, the future use of social media for personal finance is not significantly related to their current use of social media for personal finance ($\beta = 0.007$, $p > 0.05$). It seems to suggest that people are more rational when come to use social media for personal finance. Their choice of continuing using social media for personal finance or not is not influenced by the fact that whether they have used it before. Instead, such continuous choice is based on positive outcomes and individual satisfaction.

Conclusions and Implications

Therefore, the analysis of the study indicates five major findings. First, almost half of the variance of the current use of social media for personal finance can be explained the technology adoption factors. The compatibility between using social media for personal finance and individual current style of dealing with personal finance is the most dominating factor. Second, a majority of the variance (73.4%) in the future use of social media for personal finance can be explained by individual perceived financial outcomes of using social media for personal finance ($\beta = 0.775$, $p < 0.001$) and their personal satisfaction of such use ($\beta = 0.079$, $p < 0.05$). The most important finding of the analysis is: using social media for personal finance leads to positive financial outcomes ($\beta = 0.687$, $p < 0.001$) and higher satisfaction ($\beta = 0.136$, $p < 0.05$) with using social media for personal financial status. In addition, positive financial outcomes result in higher satisfaction of using social media for personal finance.

These findings have many practical implications, especially in a turbulent era that new communication and collaborative technologies, such as social media, are increasingly disrupting existing ways to approach personal finance individually and to facilitate personal finance organizationally. This research suggests that social media applications are important to both individuals and organizations in regard to personal finance. It demonstrates that both individuals and organizations must leverage these technologies effectively and maximize the benefits social media can bring, to improve consumer financial

satisfaction and enhance personal financial wealth. Above all, this study reveals social media as a legitimate and fruitful source for individuals to improve their financial well-being. Thus, individuals should examine existing social media applications that can be used for personal finance and find out which ones are useful. They should also explore the applications and select the ones that are compatible to their existing skills the most.

This study also provides insights for financial industry to address issues related to social media adoption and use for their customers. First, organizations should be aware of the positive outcomes of using social media for personal finance for their customers. They may need to explore how to use various social media to facilitate finance literacy learning and personal financial decisions. Second, they should realize that usefulness and compatibility are the most two important factors that encourage consumers to use social media for personal finance. Third, they should understand that individual social media use for personal finance are not necessarily prohibited by various environmental and security risks. While it should not be too complicated, ease of use is not considered as important for consumers' choice of using social media for personal finance. They should also try to improve consumers' compatibility.

As with other research efforts, this study is not without limitations that can offer avenues for future research opportunities. First, this study obtained data from respondents only once in 2014. Time has changed. Longitudinal study may be more fruitful in findings about social media use in personal finance over time. Second, this is not a random sampling from different geographical regions, sectors, and types of organizations but convenient sampling. Thus, the generalization of the findings of this study requires a caveat. Third, this study limits its focus on establishing the model and examining outcomes of social media use. Other perspectives of study that are not examined, such as investigating individual characteristics (e.g. race, gender, social economic status etc.), may also be important. Finally, while a thorough process involving practitioners and scholars was employed to develop a valid and reliable survey instrument, it remains possible that respondents may have experienced confusion when considering some of the terms in the survey.

Future studies should further refine the survey instrument and draw samples from larger populations in different countries across times. Other data collection methods should include in-depth multiple case studies as well as large-scale survey involving different types of customers. Proper attentions should be given to studies with group comparison and emphasis on individual characteristics. Examining the factors and outcomes in depth, such as the different level of compatibility, would also be of interest. As the research on social media evolves towards a more mature stage, more interesting and relevant findings would suggest effective use patterns and practices of social media use in the future.

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The Empirical Study on The Model of P2P Loan Default Rate Based on The Renrendai's Data**Huang Wenbin, Fuzhou University¹****Fang Hao, Fuzhou University²****Miu Xiaoyun, Fuzhou University³****Zheng Huiying, Fuzhou University⁴****Abstract**

The problem of credit risk in P2P online lending has become increasingly prominent. The default rate is the key parameter to quantify the credit risk. Therefore, it is very important to measure the default rate effectively. In this paper, based on the sample of Renrendai's data, we use the method of Logistic regression to identify the key factors that affect the default, construct the model of loan default rate, even determine that if the borrower will default. We also predict when a borrower defaults in the way of Cox regression, then we draw the survival curve of the loan based on the prediction. At last, we construct the expected returned model concerned by investors. Empirical results show that loan amount, loan interest rate and repayment period all have the positive correlation with the default rate, also have the negative correlation with loan survival time. Educational background, credit rating, credit limit, the number of borrowings, video authentication, weibo certification, academic certification, real estate certification, car certification all have negative correlation with the default rate, also have the positive correlation with loan survival time. Furthermore, the model constructed is of good predictive ability and robustness, and it is provided as a tool accessing borrowers' credit. In addition, the model can help investors weigh the income and risk. This is also beneficial to P2P platform quantifying the risk.

Key words: Binary Logistic Regression, Survival Analysis, Expected Return

Introduction

At present, China's credit system is not completed, and the Internet information is not equal, it leads to the high possibility of the default risk in lending market. And default costs every participant in P2P. On the one hand, default causes huge loss to investors and P2P platform, because it increases the cost in operating the platform, also affects investors' income. On the other hand, the borrowers pay for default, the loss they have to bear includes credit rating decreased, and the future loan opportunities reduced. We can tell that how to identify the situation about borrowers default relates to the security of investors' funds and the interests, even influence the P2P enterprise's survival. Therefore, this paper focus on the the empirical study on the model of loan defaults rate.

On the default issues in P2P lending market, domestic and foreign scholars also started a study: Lin(2009) pointed out that borrowers with lower credit rating are more likely to default. Kumar(2007) considered that credit rating, loan amount, gender, race, all these "hard information" will decide whether a borrower defaults. Freedman and Jin(2001) study on the sample of Prosper's loan data, they found that: borrowing amounts, recent credit surveys, revolving credit usage rate, loan purposes, income, credit history, FICO scores, credit ratings, etc., were significantly associated with defaults. On the research methods, Serrano-Cinca et al study on the sample of Lending Club's loan data. Firstly, they identified the factors explaining defaults in the method of Cox regression based on hypotheses

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test and survival analysis, and then they predict loan default rate by the model of Logistic regression. Carmichael(2014) used Lending Club's data as penal data to construct the model of default rate by Logistic regression, also assessed the investment income. Jin and Zhu(2015) predicted default rate in the method of data mining(DM). Vedala and Kumar(2012) predicted the default rate by Bayesian classification of multiple relationships. Because China's P2P net loan started late, and there's not plenty of published data, the empirical researches on default rate are relatively less. However, the default happens not only in P2P institutions, it's common occurrence in financial field, especially the commercial bank loans, and P2P loan is equivalent to unsecured personal credit business in traditional bank. So this paper not only reviews literature about P2P loan default, but also learn to literature related to commercial bank loan. Yu(2004) compared some mathematical tools analyzing credit risk: Discriminant analysis, Logistic regression analysis, Principal factors analysis and Neural Networks, He finally chose the Logistic regression model and used it studying default rate, weighing bank credit risk quantitatively. Qian(2010) pointed out that Probit model, Logistic model and survival analysis model etc econometric models are used widely currently. Wu et al(2010) and Bai et al(2012) predicted and measured the probability of bank borrowers default in every moment of the future by Cox proportional hazard method in survival analysis, so they would know the possible distribution of borrowers default. Liao(2014) considered that some P2P borrowers' basic published information would help predict default rate in some way. Wang(2014) studied how credit certification mechanism of P2P platform influenced loan based on Renrendai's data. The result showed that, job certification, income certification, video certification, car certification, real estate certification and other certification indicators had great impact on loan. Zeng(2015) researched on the main factors affecting borrowers repaying after they default.

By reviewing domestic and foreign literature, we find that because of the more complete credit system overseas, the published information of foreign P2P platform is different from the domestic one. Nevertheless, we conclude several kinds of information: borrowers' basic information, historical credit information, loan order information and something special to different platforms, or we can divide it into hard information and soft information. While the number of domestic researches on P2P default rate is relatively smaller, and we lack comprehensive and systematic researches. As for the main method and model, Logistic regression is the most suitable method to construct the predictive model of default rate, and it is also a good thought using survival analysis to analyze the distribution of default.

In this paper, we dig deeply in the basic statistical features of China's P2P net loan market based on real transaction data of Renrendai platform, also find out those statistical features related to loan default rate, and then construct the evaluation system of loan default rate. After that we construct predictive model of default rate in the method of Binary Logistic regression to identify the key factors affecting default. However, the model of default rate is only to determine whether a borrower would default or not, those investors are also concerned about when a borrower would default, so we have to do survival analysis by Cox regression further, draw the loan survival curve, and determine when a borrower defaults. At last, because investors focus on the interest, we construct the model of expected return based on the previous results.

Compared to previous studies, there are three innovation points in this paper: firstly, we do comprehensive and systematic study on P2P loan default issue quantitatively; secondly, this paper not only studies on loan default rate, which is to determine whether a borrower would default or not, but also further study on the distribution of default rate, that is when a borrower defaults; thirdly, this paper construct the model of default rate and the model of expected return. A in-depth analytical tool is provided for investors to determine the credit situation of borrowers, it can help investors weigh interests and risk, and optimize their investment options.

The Sample Selection and Data Description

Study sample

Given that Renrendai platform is leading in industry reputation, the number of users, trading volume, this paper takes Renrendai's real transaction data as sample, it is representative and exemplary. This paper takes credit certifications as research objects, crawling valid order data released by Renrendai website from October 12, 2010 to December 11, 2015. Because only going through the repayment period could we determine whether a order is defaulted or not, 18507 samples that orders are still in the period of repayment are removed. And for the follow-up work testing the predictive ability and robustness of the model, we designate data before 2015, a total of 15222 orders, to sample data, and designate data after 2015, a total of 3285 orders, to external data out of sample.

This paper defines default as the platform advancing the remaining loan principal when borrowers finally could not repay. At this time, the status of the order shows “advanced” in Renrendai website, this kind of orders is considered as “default”.

The selection of independent variables and descriptive analysis

This paper constructs the model of default rate based on the data from samples, next we will do descriptive analysis on sample data from four aspects: loan order, borrowers' credit information, basic information, certification information.

Loan order information: Loan amount is between 3000 and 500000 yuan, and the average is 28441.33 yuan. Loan period can be 3 months, 6 months, 9 months, 12 months, 15 months, 18 months, 24 months, 36 months, and the period of 12 months is the most accounting for 13%, the average period is 10 months. Loan interest rate is between 3% and 24.4%, and the average is 13.26%, it is almost three times as much as bank loan benchmark interest rate, and that is exactly the reason why P2P becomes popular in internet banking.

The credit information of borrowers: mainly including credit rating, the number of borrowing and credit limit. From high to low, the rank of credit rating is AA, A, B, C, D, E, HR. HR is the level most borrowers come from, accounting for 52%. In terms of average, the credit limit of HR is the smallest, only 48840.02 yuan, and the one of AA is the biggest, 364499.87 yuan. The higher credit rating, the larger number of borrowing, the borrowing number of AA is ten times as much as the one of HR. In addition, with loan order information, this paper find that: for the same amount of borrowing, the borrower in lower credit rating should pay more interests, and the repayment period is longer, while for different amount of borrowing, the borrowers in higher credit rating can loan more money than the one in lower credit. Specially, the least loan interest of AA borrowers is 11.38%, while the average loan interest of HR borrowers is 13.57%, they have to pay more for loan interest. And the average repayment period of AA borrowers is 7 months, while the average repayment period of HR is 10 months.

Basic information of borrowers: the age of borrowers is mostly distributed in 30 to 40 years old, the youngest among them is 22 years old. The borrowers are mostly married, most of them have 1-3 years or more than 5 years working experiment, and their educations are mostly distributed in college and undergraduate.

Certification information of borrowers: according to Renrendai's regulation, a borrower should submit certification material to platform for being audited when applying for a loan. As for credit certification, authentication, credit report certification, job certification, income certification are necessary certifications. Only after certification passed, could you apply for loan in the platform, so this paper doesn't consider these four kinds of certification. Other optional certifications include: real estate certification, car certification, mobile phone real name authentication, weibo certification, video certification, academical certification etc. Among them, real estate certification and car certification reflect on the borrowers' asset status, borrowers should provide corresponding proof of title. Academical certification is uploading borrowers' academic qualification. Phone real name certification is for convenience in management after the loan, it makes sure that the platform can keep touch with borrowers. Weibo certification reflects on the borrowers' social relations, it needs borrowers to provide weibo accounts for certification. While video certification needs borrowers to upload personal video. The result of descriptive analysis shows that, in borrowers who passed verification, 42.59% of them are video certificated, it's the largest proportion. Followed by real estate certification and car certification, accounting for 34.81% and 34.40% respectively, and the proportion of borrowers passing academical certification or weibo certification is the smallest. We can tell that, academical certification and weibo certification are less important for borrowers.

The default rate evaluation index system

Through the correlation between the various factors and the loan default rate, in which the continuous variables using t test, discrete variables using the chi-square test, and found that, except for age, the remaining variables have a certain relationship with the loan default rate, so they are all included, and we can build a relatively comprehensive indicator system:

Table 1. Index system.

<i>Variable name</i>	<i>Explanation</i>
<i>Loan Amount</i>	The borrower's fund raising amount, it is also the total bid amount of the investor, logging the large number
<i>Interest Rate</i>	Borrowers need to pay the interest rate level
<i>Term</i>	The borrower repayment period, equivalent to the investor's investment period
<i>Education</i>	Borrower's qualifications, 1 means high school or below, 2 means college, 3 means undergraduate, 4 means graduate or above
<i>Marriage</i>	Borrower's marital status, 0 means unmarried, 1 means married
<i>Employment Length</i>	Borrowers' working life, 1 means less than 1 year, 2 means 1-3 years (inclusive) , 3 means 3-5 years (inclusive), 4 means more than 5 years
<i>Credit rating (Grade)</i>	The credit rating of the platform to the borrower, 1 for the lowest level HR, 2 for E, 3 for D, 4 for C, 5 for B, 6 for A, 7 for the highest level AA
<i>Line of Credit</i>	Credit line, logging the large number
<i>Number of borrowings (Frequency of Borrowing)</i>	Borrowers' total number of applications for loans in the past
<i>Video Cert</i>	Whether the borrower upload video to prove his identity, 0 means no upload, 1 means uploaded;
<i>Mobile phone real name authentication (Mobile Cert)</i>	Whether the borrower binds the phone number to the loan account applied for, 0 means unbound, 1 means bound
<i>Weibo Cert</i>	Whether the borrower provides Weibo account for certification 0 means that the borrower did not apply for weibo certification / certification failed to pass, 1 means weibo certification passed
<i>House Cert</i>	Whether the borrower provides proof of housing ownership 0 means no real estate certification / certification failed to pass, 1 means real estate certification passed
<i>Car Cert</i>	Whether the borrower provides vehicle ownership certificate 0 means no vehicle production certification / certification Failed to pass, 1 means that the vehicle production certification passed
<i>Education Cert</i>	Whether the borrower upload their own student status verification 0 means no academic certification / certification failed to pass, 1 means academic certification passed
<i>Loan default or not (FundingPrb)</i>	When the borrower fails to repay the loan in the end, the platform lends the residual loan principal, it is regarded as "default", the non-default assignment is 0 and the default assignment is 1

The Empirical Results

Loan default judgment

We know that Logistic regression is a very useful tool when it comes to predicting binary dependent variables through a series of continuous and categorical independent variables. At the same time, through the review of domestic and foreign literatures, we find that most scholars use Logistic regression as a method to construct the default rate forecasting model. Therefore, this paper selects dichotomous Logistic regression to construct the default rate model.

Construct the default rate model by dichotomous Logistic regression

Based on the above index system, the binary Logistic regression and AIC information criterion are used to regress the variables step by step. In this paper, the three variables of marriage, working life and mobile phone real name certification are excluded. They are considered as having no impact on loan default rate. In this paper, variance expansion factor is used to test whether there is multicollinearity in the model. The result shows that there is no multicollinearity in the model. The best default rate forecasting model is as follows:

$$\begin{aligned} \text{Default} = \{ & 1 + \exp[-(-4.842507 + 0.884200 \ln(\text{Loan Amount}) \\ & + 0.076867(\text{Interest Rate}) + 0.083296(\text{Term}) - 0.451550(\text{Education}) \\ & - 1.730689(\text{Grade}) - 0.522762 \ln(\text{Line of Credit}) \\ & - 0.085723(\text{Frequency of Borrowing}) - 0.609600(\text{Video Cert}) \\ & - 0.414925(\text{Weibo Cert}) - 0.382377(\text{House Cert}) \\ & - 0.463714(\text{Car Cert}) - 0.631547(\text{Education Cert})] \}^{-1} \end{aligned}$$

Table 2. Logistic regression results of final variables.

	<i>Coefficient</i>	<i>Standard deviation</i>	<i>Z statistics</i>
<i>Intercept</i>	-4.842507***	0.453830	-10.670
<i>Loan amount logarithm</i>	0.884200***	0.082287	10.745
<i>Loan interest rate</i>	0.076867***	0.012235	6.283
<i>Repayment period</i>	0.083296***	0.004093	20.349
<i>Education</i>	-0.451550***	0.039335	-11.480
<i>Credit Rating</i>	-1.730689***	0.082399	-21.004
<i>Credit line logarithm</i>	-0.522762***	0.074779	-6.991
<i>Number of borrowings</i>	-0.085723***	0.014870	-5.765
<i>Video certification</i>	-0.609600***	0.084107	-7.248
<i>Weibo certification</i>	-0.414925***	0.128159	-3.238
<i>Real estate certification</i>	-0.382377***	0.093071	-4.108
<i>Car purchase certification</i>	-0.463714***	0.096572	-4.802
<i>Academic certificate</i>	-0.631547***	0.115886	-5.450

Note: "****", "***", "**" indicate significance at significant levels of 0.01, 0.05, and 0.1, respectively, which is common to the following tables. (Due to space limitations, the detailed Logistic regression process is not reported and is available to authors upon request.)

According to the above regression results, the effect of each factor on the default rate is summarized as follows: the more the loan amount, the greater the probability of default when the macro economic fluctuation or the borrower's income decreases. The higher the borrowing rate, the higher the cost of borrowing, and likely to default; The longer repayment period increases the uncertainty of repayment, the higher the default rate; The higher the education level of the borrower, the higher the degree of education, the more emphasis on credit, and less likely to default; The higher the borrower's credit rating, the smaller the default rate; The more the borrower's credit line and the larger number of borrowings, the less the default rate; As for the certification information, video certification, weibo certification, real estate certification, car certification, academic certification, compared to the non-certified certification, the possibility of default is small. In the process of stepwise regression, we found that the impact of various factors on the loan default rate is, in descending order of importance, credit rating, repayment term, academic record, loan amount, video certification, credit limit, loan interest rate, loan amount and education record certification, car certification, real estate certification, weibo certification. It can be seen that the credit rating of Renren Loans has a great reference value, which reduces the information asymmetry between the lenders and borrowers, and the qualification of academic qualifications that is easily overlooked by the borrower is still valued by the investors in actual transactions.

Forecasting ability test

For investors, they use the default rate forecasting model to credit borrowers, the accuracy of the judgment is very important. So we use the data outside the sample to test the predictive ability of the model. For the test of model predictive effect, we need to determine the probability threshold to establish the default criterion. In this paper, we use the prior selection method to determine the probability threshold. Since the default order outside the sample is 28.34%, the probability threshold is

28.34%. When the predicted default rate higher than 28.34%, the borrower is convicted as a default borrower, otherwise as a good borrower. Based on the above criteria we test the ability of the model forecasting, the results are as follows:

Table 3. Model to determine the accuracy of verification results.

<i>Prediction \ Actual</i>	<i>Default</i>	<i>Not default</i>	<i>Total</i>	<i>Discrimination accuracy rate</i>
<i>Default</i>	597	116	713	83.73%
<i>Not default</i>	334	2238	2572	87.01%
<i>Total</i>	931	2354	3285	86.30%

According to the results of Table 3, when a borrower is predicted to default, the rate he defaults actually is 83.73%. However, when a borrower is predicted to not default, the probability of mistake is only 12.99%. The overall correct rate is 86.30%. Obviously, the default rate forecasting model established in this paper has a good ability to predict, to make a more correct recognition of default. It provides favorable basis for the credit evaluation of the borrower before the investor makes the investment. The investor can apply it to the investment decision-making and risk prediction as well as the platform to assess the default rate of the borrower, avoid the risk as much as possible and strengthen risk control management.

Robustness test

The robustness test verifies whether the empirical results change as the parameters are set or not. If the parameters of the model change, then the coefficient sign and significance of the model change, the model is not robust. As a test of the robustness of the empirical results above, this paper starts with the data considering whether the sample selection affects the results. Especially if the model of this paper is constructed based on the data in the sample, then the sample scope is extended to all the samples. Is the result still robust? Second, since 2012, P2P lending has entered a phase of rapid development in the industry. The P2P lending business of various platforms has been booming. Meanwhile, since 2012, the Renren Loans lending platform has strengthened the control of the borrower's risk. As mentioned above, the interest rate range of borrowings has been limited and the pre-lending management has been enhanced. The pre-order review mechanism has been introduced. Therefore, considering 2012 as the demarcation, the introduction of the virtual variable D2012, the data after 2012 set to 1, the data before 2012 set to 0, the previous result is still robust? The robustness results are shown in Table 4 and it can be seen that the results remain robust when the sample size is expanded to all samples. Looked at the results of the introduction of D2012 variable sample data, D2012 variables failed to pass the significance test, it can be seen that the borrower's breach of contract is not affected by changes in Renren loan interest rate policy. The borrower will not reduce the number of breaches due to the introduction of a pre-examination mechanism for all loans, and it will not increase the number of breaches after the booming development of the lending platform. In conclusion, the introduction of the full sample of the D2012 variable shows that the sign and the significance level of the coefficient of the variables are stable compared with the previous results, indicating that the loan default rate model constructed in this paper has good robustness.

Table 4. Robustness test.

	<i>Model One</i>	<i>Model Two</i>	<i>Model Three</i>
<i>Intercept</i>	-4.842507***	-3.998821***	-3.96267***
<i>Loan amount logarithm</i>	0.8842***	0.967247***	0.97209***
<i>Loan interest rate</i>	0.076867***	0.026564**	0.02538**
<i>Repayment period</i>	0.083296***	0.095382***	0.09551***
<i>Education</i>	-0.45155***	-0.515234***	-0.51506***
<i>Credit Rating</i>	-1.730689***	-1.877243***	-1.87684***
<i>Credit line logarithm</i>	-0.522762***	-0.59359***	-0.59702***
<i>Number of borrowings</i>	-0.085723***	-0.080101***	-0.08018***
<i>Video certification</i>	-0.6096***	-0.791045***	-0.78942***
<i>Weibo certification</i>	-0.414925***	-0.365223***	-0.36843***

<i>Real estate certification</i>	-0.382377***	-0.380775***	-0.38131***
<i>Car purchase certification</i>	-0.463714***	-0.533037***	-0.53342***
<i>Academic certificate</i>	-0.631547***	-0.659168***	-0.66055***
<i>Virtual variable</i>	---	---	-0.03853
<i>Sample size</i>	15222	18507	18507

Note: The first model is for the data in the sample. The second model is for all the sample data. The third model is for all the sample data of the dummy variable

Loan survival analysis

As the investor's interest income ends up with the default time of the borrower, the investor is not only concerned about the borrower's credit rating, but also cares about the time interval between the occurrence of the borrowing order and the time of default, that is, the life time of the order, or the order Survival. The Cox proportional hazards model can simultaneously consider the influence of multiple related factors on the survival time, which includes both the parameter information and the non-parameter information. It is a multi-factor survival analysis method. The model can analyze the data with censored data (Censored data refers to specific events that have not taken place in the observed sample at the end of the observation period, resulting in a loss of data.) Survival analysis data. These good properties make the model effective and widely applicable, so the next life-saving analysis of the loan using Cox regression. First determine the observation period, as the repayment period of people's loan orders up to 12 months, so the observation period was determined to be 12 months, select the sample repayment period of 12 months for Cox regression orders.

Loan lifetime Cox regression results

The Cox regression's independent variables follow the default rate model's independent variables. Since only the order samples with the repayment period of 12 months are considered, the variable of repayment period originally included in the regression becomes a constant and should be removed. Table 5 below shows the results of the survival analysis of the 12-month maturity loan sample. The table shows Cox regression coefficients, standard deviations, accompanying probabilities p-values, hazard ratios. Cox regression is the risk as the dependent variable, the positive and negative of the regression coefficient directly reflects the direction of the variable for the survival risk, RR used to explain the other conditions remain unchanged, the variable for each additional unit risk changes how much Times, the general $RR > 1$, the greater the multiple, that the shorter the life of the loan, the earlier the default time; $RR < 1$, then the other hand.

From the Cox regression results, the following conclusions can be drawn from the paper: From the p value, all variables passed the significance test at 10% significance level, indicating that all the variables are related to the length of the loan life cycle. From the regression coefficient, the regression coefficient of borrowing rate and borrowing amount is positive and is a risk factor, so the interest rate of borrowing or the amount of borrowing increases, the shorter the life time of the borrowing, the earlier the borrower defaults within the repayment period; the credit rating, The negative regression coefficients of academic qualifications, borrowing amount and credit line are protective factors. The increase of these variables will reduce the risk of survival of the loan. Borrowers have qualifications, Weibo, real estate, car or video certification, compared with no certification of the borrower, certified borrower breach of contract more late or non-default. In addition, comparing the absolute value of each regression coefficient, it can be seen that the relative importance of each factor to the length of loan life, in descending order of credit rating, loan amount, academic certification, video certification, Weibo certification, car certification, Qualifications, real estate certification, credit limit, the number of loans, loan interest rates. Finally, compared to the danger of several certification ratio, we can see that in favor of the survival time of the certification descending order: academic certification, video certification, microblogging certification, car certification, real estate certification.

Table 5. Cox regression results for 12-month loans.

	β	SE	Sig.	RR
<i>Loan amount logarithm</i>	0.512	0.116	0.000	1.668

<i>Loan interest rate</i>	0.057	0.019	0.003	1.059
<i>Education</i>	-0.316	0.049	0.000	0.729
<i>Credit Rating</i>	-1.522	0.107	0.000	0.218
<i>Credit line logarithm</i>	-0.217	0.105	0.039	0.805
<i>Number of borrowings</i>	-0.096	0.022	0.000	0.908
<i>Video certification</i>	-0.367	0.107	0.001	0.693
<i>Weibo certification</i>	-0.331	0.184	0.072	0.718
<i>Real estate certification</i>	-0.222	0.110	0.044	0.801
<i>Car purchase certification</i>	-0.318	0.115	0.006	0.728
<i>Academic certificate</i>	-0.474	0.155	0.002	0.623

Loan survival curve

Through the above Cox regression, we further draw the loan life curve. Figure 1 shows the survival curve of one-year loans, showing a monotonous decrease, that is, when the order is generated, the default rate of the borrower is 0, and the closer to the repayment date, the possibility of default may be The larger, so for the P2P platform, near the repayment date should pay attention to the performance of the borrower's repayment.

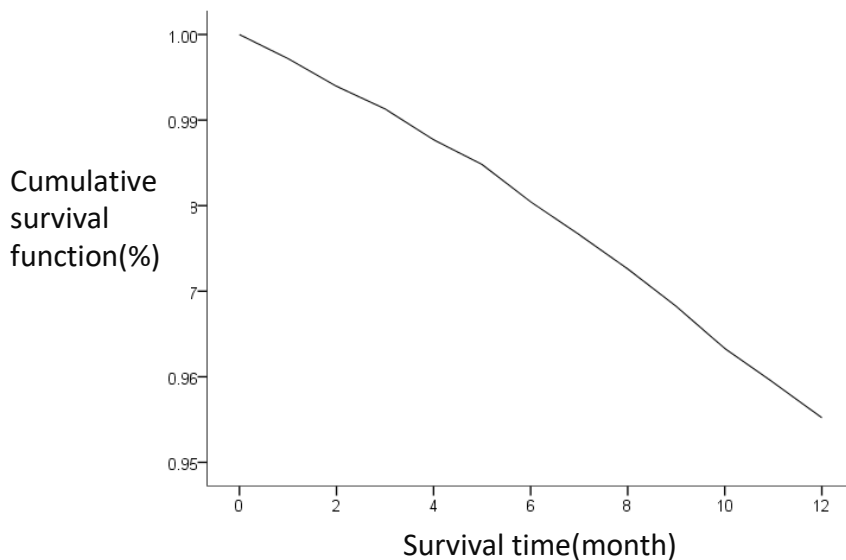


Figure 1. Survival curve of one-year borrowing order

Also: Logistic regression results of forecast defaults or predict default time Cox regression results, the influence factors of No. 1 is a credit rating, so this article draw the different credit rating of the loan repayment period of survival curve, as shown in figure 2. Obviously AA loan repayment period, the survival rate is 100%, namely AA borrowers in the repayment period is not default, instead of HR survival within the reimbursement deadline is more and more small, a minimum around 77%, the default rate is as high as 23%.

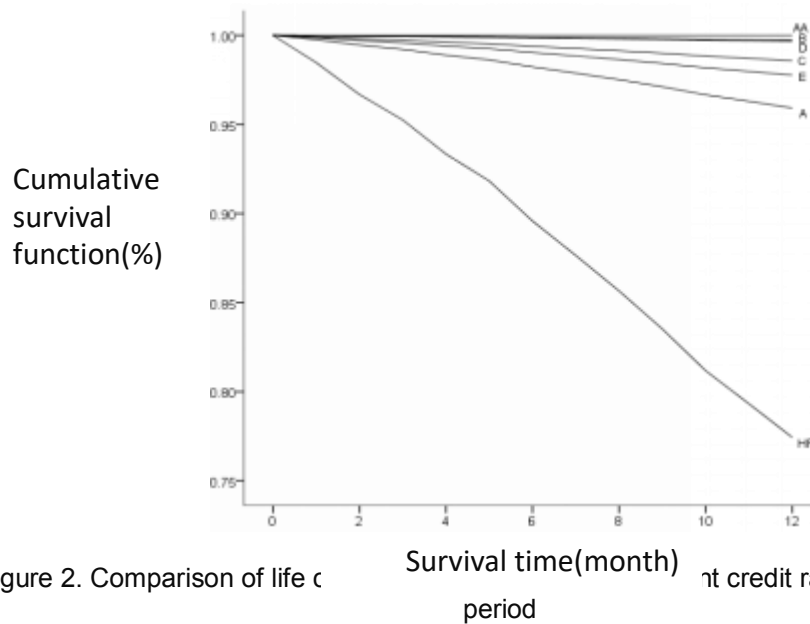


Figure 2. Comparison of life cycle credit ratings over a one-year period

Constructing the expected revenue model.

For investors, the amount of investment required to borrowers in the investment period to obtain principal and interest income every month, they are most concerned about the investment income. Therefore, it is necessary to construct the expected return model. In general, a loan, the borrower either repay on time, then default, or early repayment. Therefore, to construct the default rate model alone is not enough to estimate the return on investment, but also to build an early repayment rate model.

Early repayment rate model

In the actual transaction, the borrower usually repay the loan in advance due to personal factors (such as the level of financial ampleness) or due to objective factors (such as the difference between the lending rates of various P2P online lending platforms). First of all, the definition of early repayment which is analyzed in this paper is first defined. It refers to repayment of the remaining principal of all the loans in advance in a certain period, so the loan in the next period will cease to exist. The same is true for the prepayment in the actual trading of Renren Loans platform.

To maintain the consistency and consistency of the entire study, an early repayment rate model was constructed using sample data, independent variables, and methods for building a loan default rate model. Among them, the non-prepayments assignment is 0, prepayments assignment is 1. Table 6 below shows the Logistic regression results:

$$\begin{aligned} \text{Early Repayment} = \{1 + \exp[& -(-0.209829 - 0.862921 \ln(\text{Loan Amount}) \\ & + 0.029043(\text{Interest Rate}) + 0.071557(\text{Term}) + 0.095325(\text{Education}) \\ & + 0.058219(\text{Grade}) + 0.554456 \ln(\text{Line of Credit}) \\ & - 0.025830(\text{Frequency of Borrowing}) - 0.039862(\text{Video Cert}) \\ & + 0.284914(\text{Weibo Cert}) - 0.136672(\text{House Cert}) \\ & - 0.228045(\text{Car Cert}) + 0.117929(\text{Education Cert})] \}^{-1} \end{aligned}$$

In this paper, the prepayment probability of the borrower can be calculated according to the information provided by each borrower.

Table 6. Early repayment rate model logistic regression results.

	<i>Coefficient</i>	<i>Standard deviation</i>	<i>Z statistics</i>
<i>Intercept</i>	-0.209829	0.287996	-0.729
<i>Loan amount logarithm</i>	-0.862921***	0.032234	-26.770
<i>Loan interest rate</i>	0.029043***	0.007200	4.034
<i>Repayment period</i>	0.071557***	0.003120	22.934
<i>Education</i>	0.095325***	0.027897	3.417
<i>Credit Rating</i>	0.058219***	0.015392	3.782
<i>Credit line logarithm</i>	0.554456***	0.030277	18.313
<i>Number of borrowings</i>	-0.025830***	0.002151	-12.009
<i>Video certification</i>	-0.039862	0.055858	-0.714
<i>Weibo certification</i>	0.284914***	0.063281	4.502
<i>Real estate certification</i>	-0.136672**	0.060132	-2.273
<i>Car purchase certification</i>	-0.228045***	0.060104	-3.794
<i>Academic certificate</i>	0.117929**	0.059107	1.995

According to the regression results, the impact of various factors on loan prepayment rates is summarized as follows: The coefficients of loan variables, academic qualifications, credit ratings, credit limits, Weibo certification and academic certification are the opposite of those of the default rate model. In other words, the more borrowing money, borrowers need more funds, and often will not repay in advance; the higher education, the stronger the concept of financial management, compared with follow-up interest payments and early repayment fines, often choose to repay in advance; credit The higher the rating, repayment willingness and ability of the stronger, the greater the probability of early repayment; the more credit, quick cash flow, the possibility of early repayment. Other variables, such as loan interest rates, repayment terms, the number of loans, real estate certification, car certification and regression coefficient of the direction of the same as the default rate of return. In other words, the higher the interest rate of the loan, the higher the interest cost to be paid. If the repayment is advanced, the loan cost can be reduced. The longer the repayment period, the more sufficient the time for raising the repayment, and the greater the possibility of early repayment. The more loans, the higher the capital turnover, the greater the repayment rate in advance. In addition, this article also found that personal video certification prepayment does not have much impact.

Expected return model

In this paper, we use the most commonly way to estimate the expected return of investors. The expected return of the investor is the return on the value of all expected future investment.

$$\begin{aligned} \text{Returns} &= A(1+i)^N \\ &= AR \end{aligned}$$

Where, *Return* is the final value, which is here to estimate the expected return on investment, *A* is the investment principal, *i* for the monthly interest rate, *N* for the investment period (months), *R* for the expected return on investment.

When early repayments occur, Renren Loans lends the borrower an extra 1% of the liquidated damages to investors. When a breach occurs, Renren Loans guarantees the principal part of the investor's loan. Estimated earnings steps are as follows:

$$R_t = p_t [p_{\text{early},t} 1.01(1+i)^t + p_{\text{default},t} (1+i)^t]$$

Among them, that the $t=1, 2, \dots, N-1$ is the first month, the second months, ...; *i* for the monthly interest rate. $p_{\text{default},t}$ and $p_{\text{early},t}$ are respectively the default rate and prepayment rate of loans in the first month, which can be obtained from the loan default rate model and prepayment rate model constructed in this paper. P_t is the probability of whether the loan still exists in the first month

$$p_t = p_{t-1} [1 - (p_{\text{early},t-1} + p_{\text{default},t-1})]$$

Among them, $p_1=1$, because the $t=1$, the loan must exist. When $t=2$, the probability that the loan order still exists is the probability of excluding prepayment and default in the previous period. And followed by iteration.

Step two: Calculate the expected return on investment for the last month, the *N*th month, as:

As the last month there is no advance repayment, $p_{\text{early}}=0$, so the expected return on investment:

$$\begin{aligned}
 R_N &= p_N [(1 - p_{\text{default},N} - p_{\text{early},N})(1+i)^N + p_{\text{default},N}(1+i)^N] \\
 &= p_N [(1 - p_{\text{default},N})(1+i)^N + p_{\text{default},N}(1+i)^N] \\
 &= p_N (1+i)^N
 \end{aligned}$$

Step Three: Calculate the expected return on investment:

$$\text{returns} = A \sum_{t=1}^N R_t$$

Where $\sum_{t=1}^N R_t$ is the total expected return on investment for each month, the expected return is the investment principal multiplied by the total investment return.

Step four: Calculate the return on investment:

$$\begin{aligned}
 ROI &= \frac{\text{returns} - A}{A} \\
 &= \frac{A \sum_{t=1}^N R_t - A}{A} \\
 &= \sum_{t=1}^N R_t - 1
 \end{aligned}$$

The return on investment (ROI) is the rate at which an investor earns extra on the investment principal when the investment matures.

Model predictive ability test

In order to test the predictive effect of the constructed model of expected return, based on the model, the expected return on investment (ROI) per loan for all samples was calculated. In addition, according to credit rating, year and repayment period of three dimensions, the expected return on investment and the actual return on investment, as shown below:

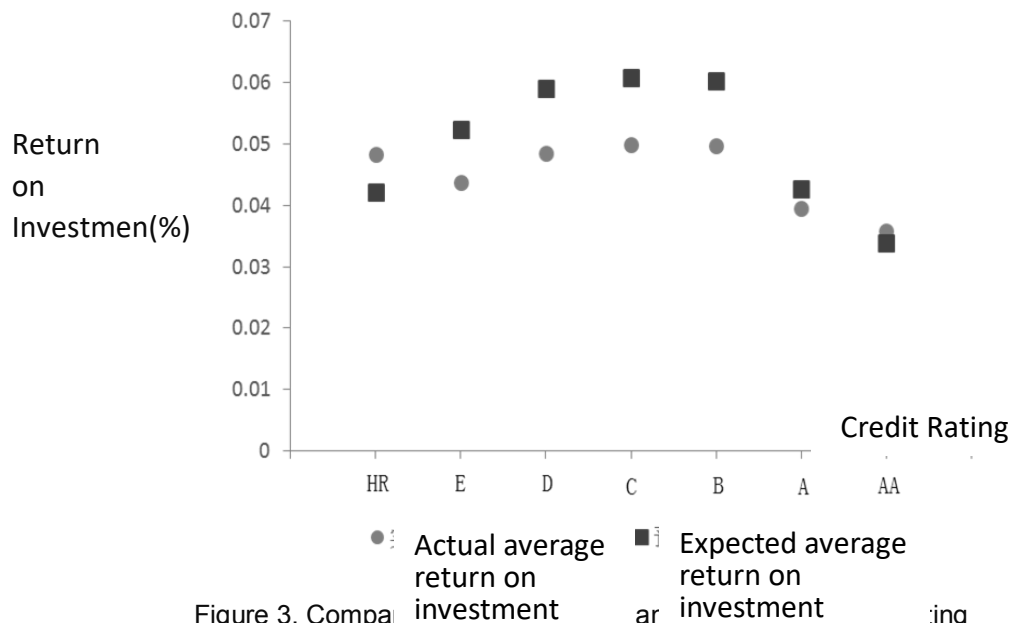


Figure 3. Comparison of actual and expected average return on investment by credit rating

The difference between the expected value and the actual value of different credit rating orders is also in the range of 0.01. At the same time, this paper finds that orders B, C and D have the highest return on orders, followed by E and HR, while orders AA and A have the lowest returns on orders. Probably because borrowers with higher credit ratings (AA and A) tend to have lower interest costs to pay and less interest income to investors, so the ROI is lower; while the lower the credit rating Borrowers need to pay higher interest costs, but they are more likely to default, which means that high yields and high risks co-exist. Investors can also obtain advice to make investment decision: choose to

invest in B, C, D rating of the borrower, such borrower to pay the medium level of interest cost, and the risk of default is also centered. Comprehensively, the return on investment is the highest.

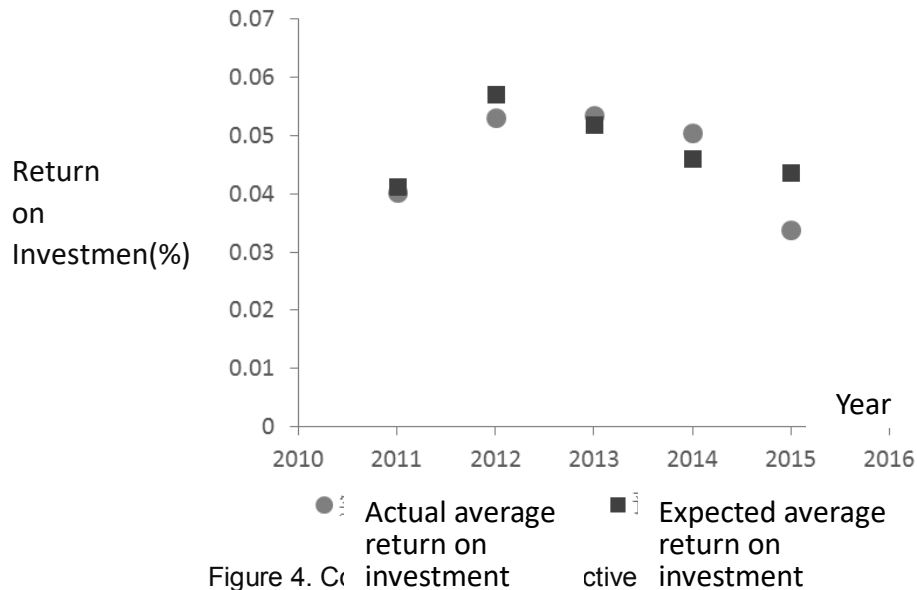


Figure 4. Comparison of actual average return on investment and expected average return on investment

Since the Renrendai is set up in October 2010, the order data in 2010 is only 89, accounting for a very small proportion of 0.48%, which is not comparable. Therefore, only the sample of 2011-2015 is selected for the comparison of actual average return rate on investment and expected return rate on investment. In general, the expected value fluctuates around the actual value with a difference of 0.01. At the same time, both of them reached the maximum value in 2012, possibly due to the outbreak of P2P in 2012 and the rapid increase of transaction volume. In addition, the new rules for implementing the loan interest rate for Renrendai in 2012 changed from the original un-set interest rate limit to the setting interest rate range, equivalent to raising the interest rate floor, the return on investment is naturally increased. However, the decline in 2015 may be due to the emergence of major P2P platforms in 2015, the P2P market share being divided up and the overall yield of all platforms decreased. Meanwhile, in 2015, the state stepped up its supervision of P2P platforms, it also made the return on investment decreased.

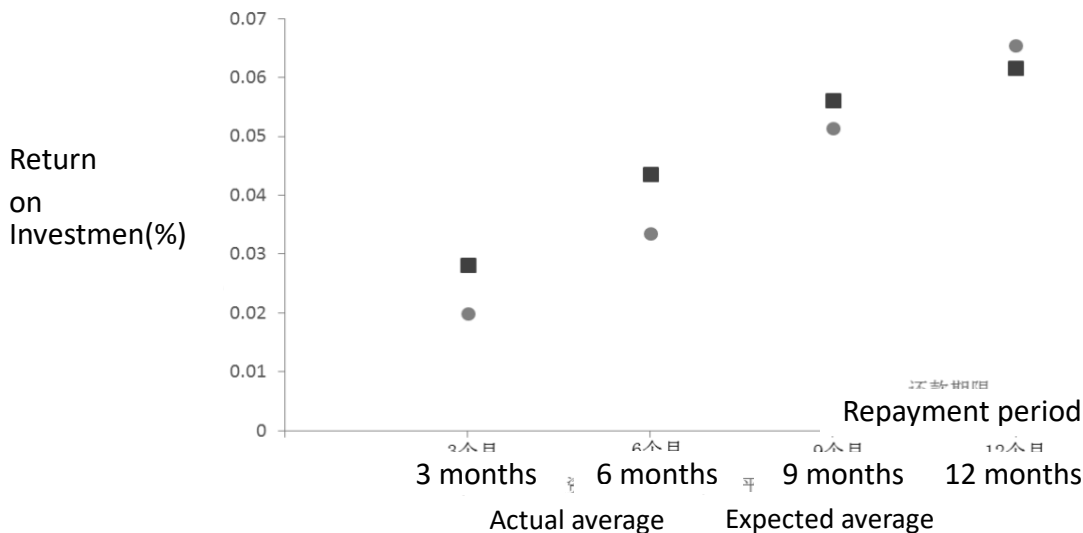


Figure 5. Comparison of expected return on investment and actual return on investment by repayment term. Because orders for 15 months, 18 months, 24 months, and 36 months are accounted for a very small proportion of the total sample size of 0.4%, 2.2%, 6.9% and 1.8% respectively, it is not meaningful for comparison. Only the orders of 3 months, 6 months, 9 months, 12 months are selected for the comparison of actual average return rate on investment and expected return rate on investment. It can be seen that the expected return model has good predictive effect for orders of 3-12 months. In addition, this paper found that the longer the repayment period is, the actual average return on investment is higher, the highest is 0.07; otherwise it is the lower, the lowest is 0.02. In addition, this

paper can be concluded to some advice for investors: for aggressive investors can choose long repayment orders, but they have to bear the longer repayment period, and the uncertainty of borrower's repayment behavior brought by long repayment period; for relatively conservative investors, you can choose orders with short-term repayment, although the return on investment is relatively small, but the capital withdrawal is faster.

We compare the average expected return on investment and the actual average return on investment in three dimensions above, from the result, we can see that the constructed expected return model is of good predictive ability.

Conclusions and Recommendations

This paper analyzes the problem of loan default from a variety of perspectives: from the default rate model of whether a borrower defaults to a loan survival analysis of when a borrower defaults, until the final estimated expected return, an orderly and in-depth process, reached the original intention of this study, the results obtained are impressive, with practical significance and reference value. Through the whole empirical research, this paper draws some conclusions, which can be summarized as follows: first, the basic characteristics of P2P borrowers and loan orders; second, the key factors that affect the default and default time; third, the basis to determine whether the borrower repay early or not; fourth, the method of estimating the expected return.

In the process of empirical research, this paper summarizes some suggestions that are helpful to borrowers in getting loans, helping investors to optimize their investment plans, and improving the control and management of risks in P2P platform. For borrowers, they should pay special attention to their own Credit rating, the higher the credit rating is, the bigger the possibility is that they get loan, at the same time borrowers should not ignore the academic certification, in the actual transaction investors still valued it, the borrower should actively submit academic certification related to audit information. For investors, in considering whether or not to invest in a loan order, they should take into account the borrower's loan amount, loan interest rate, repayment period, academic qualifications, credit rating, loan amount, credit limit and four (academic, Weibo, video, Real estate, car production) certification. Risk appetite investors can choose to repay long orders; and risk averse investors are more suitable for short repayment orders. In addition, investors can prioritize orders with credit ratings of B, C, and D, ROI of these orders tends to be the highest. For the platform of risk control, pay attention to the repayment performance of the borrower in the near repayment date, in a timely manner to deal with.

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Use of Social Network Services, Social Capital, and Consumer Capability for Transaction in South Korea

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Introduction

About seven-in-ten Americans are reported to use social media to connect with one another. This number has been dramatically increased from 5% of American in 2005 to 69% in 2015. Globally, 2.46 billions of people in the world are using social media in 2016, accounting for about 32% of the global population and this figure is estimated to grow up to 2.77 billion in 2019 (Statista, 2017). Social media became the most part of one's daily life like entertaining oneself, Internet browsing, reading the news, sharing information about the all kinds of personal experiences, and having social relationships beyond social boundaries by networking. The most popular social media around the world is the Facebook.

Korea is one of the countries with highest number of monthly active social media users, 83% of the general population was SNS users in 2016 and almost 42 millions of Korean access to social media, 2017 (Statista, 2017). It is also noteworthy that the adoption of social network services was remarkable among young adults in the early stage, older adults have constantly adopted it in recent years (Pew Research Center, 2017).

Acknowledgment of a brisk use of social network service more than ever, questions can be raised about the potential outcomes of widespread use of social network services or benefits related to using SNS from the consumers' perspective. Taken from the classification by Putnam (2001), social capital is seen as having two different forms of capital: bonding capital and bridging social capital. Bonding social capital is available among homogenous groups like family, friends, co-workers in one hand, bridging social capital among heterogeneous groups in the other. While bridging social capital can be generated by group of people in organizations or coalitions holding common interests, purposes and goals from diverse socio-economic backgrounds, bonding social capital can be created be through reciprocal exchanges of assistances like emotional, functional, monetary assistance, and care among family or neighbors

We attempted to measure social capital of SNS users in South Korea and to examine how it is associated with consumer capability for transaction. A wide range of information is required for consumer to make a purchase decision. Use of social media changed consumer information search behavior. Consumers' engagement in electronic word-of-mouth (WOM) becomes far more critical to their consumption life. We hypothesized social networks that consumers build with homogenous and heterogeneous others could generate social capital and then it has a positive effect on a consumers' capability with regard to transaction behavior.

Method

The primary data were collected using the online research agency, *The Embrain* (see embrain.co.kr) by request. Questionnaires were sent to adults aged 20 to 49 that are the most actively engaged in social media residing in six metropolitan cities including Seoul, Busan, and Incheon in South Korea. The survey was conducted during September 11 – 15 in 2017 and the number of respondents for the final analysis is 543 respondents.

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Measurement

Bridging social capital can be defined as a person's sense of feeling connected to others that are heterogeneous. The more a person is communicating with others through social network services, the more s/he is connected to one another. Bridging social capital is measured with the mean of 7 items using 5-point Likert scale by asking about how much one is connected to other people with different social backgrounds. Items include as follow: Communication with people makes me.....(1) being more interested in others with having different opinions, (2) feel myself a part of a larger group, (3) being more curious about what others go through, (4) feel connected to others in the world, (5) being interested in social issues, (6) being more aware of all social issues that could be mine as well, and (7) feel more likely to help / support others in need. The alpha of the reliability test was 0.841.

Bonding social capital can be defined as a person's sense of being supported by people that are close or homogeneous. To measure bonding social capital, 4 items were used as follows: I believe I have....(1) someone who can freely talk about personal worrisome, (2) someone that I can keep in touch when I feel lonely, (3) someone that I can ask for important things, and (4) someone who ask for advice before making important decisions in my life. The alpha of the reliability test was 0.859.

In this study, a consumer transaction capability is understood as the ability to perform transactions of goods or services in the market to achieve certain outcomes. This concept is seen as consisting of three components: (1) attitude, (2) knowledge, and (3) action. Consumer attitude toward good transaction was measured using 9 items representing general attitude toward how to transact such as importance of information search, reading label, understanding the terms, returning goods if necessary, and the responsibility as a consumer. To measure consumer's action for transaction, respondents were asked to report what they actually do for right transaction including using consume –related website, being critical for consumer information, comparing prices, quality among alternatives, raising voice about complaints, and passing information to other consumers in need.

Use of SNS is measured with daily time spent on using social media such as Facebook, Instagram, Kakao, and so forth. The most frequently used social media in South Korea is Facebook (42.4%) and Instagram (20.1%) and KakaoStory (19.2%) followed. As for the time of using social media, about 31% of respondents reported 10 – 30 minutes a day for using social media and 27% of respondents 30 – 60 minutes. Also heavy users using social media more than 2 hours a day was almost 10%.

Results

Table 1 displays bridging and bonding social capital by selected characteristics. When it comes to bridging social capital, gender difference was identified and female was more likely to engage in larger and more heterogeneous social networks than their counterpart. Bridging social capital was also different by marital status. As for bonding social capital, gender, age, marital status, and education did not make any different in social capital.

Table 1 Social Capital by Demographic Characteristics

	Bridging Social Capital	t/F	Bonding Social Capital	t/F
Gender				
Male	3.33	t=-2.32*	3.36	t=-.68
Female	3.45		3.40	
Age				
20-29	3.34	F=1.39	3.41	F=.23
30-39	3.39		3.35	
40-49	3.44		3.38	
Marital Status				
Single	3.33	F=3.55*	3.32	F=1.68
Married	3.45		3.44	
Others	3.50		3.47	
Education				
High school graduate	3.31	F=1.05	3.28	F=1.16
College	3.34		3.43	

College graduate	3.39		3.37
Post college	3.48		3.52
Time of using social media			
Less than 10 min	3.24		3.27
10 min – 30min	3.32		3.29
30 min – 1 hour	3.41	F=2.98*	3.37
1 hour – 1hour 30 min	3.48		3.45
1 hour 30min – 2hours	3.56		3.54
More than 2 hours	3.53		3.54

Note: *p<.05; **p<.01; ***p<.001. Measure of social capital used 5-point Likert scale.

The results of multivariate regression analysis showed that consumers attitude toward good transaction is significantly affected by bridging social capital ($t=3.54$, $p=.000$) and bonding social capital ($t=8.36$, $p=.000$). As for consumers knowledge, bridging social capital had a significant effect ($t=3.62$, $p=.000$) but not bonding social capital did not. Additionally, consumer action was influenced by bridging ($t=3.38$, $p=0.01$) and bonding ($t=5.56$, $p=0.000$) significantly. That is, being connected to heterogeneous and homogenous people can provide better transaction capability to consumers when they purchase goods and services. Use of social media led to the formation of social capital available and consequently contributed to consumers' capability in terms of transaction context.

Discussion

Under the condition that widespread use of social media globally, a question can be raised whether or not it could increase a consumers' capability with regard to transaction. Will being connected to one another and interacting with them in a variety of way create social capital to increase consumers' actual capability consisting of attitude, knowledge, and action? It could enhance reciprocal cooperation and provide information to encourage other's right decision-making. Findings suggested that social media facilitate consumers' connection/networks and generate bonding social capital among homogeneous individuals and bridging social capital among heterogeneous ones. Consequently, those social capitals played a significant role in improving individual consumers' capability.

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Quantitative Analysis on the Influence Factors of Chinese College Students' Use of Consumer Credit**Author: Fang Yan****Co-author: Lishu Zhang* (presenter)****¹Graduate Student, College of Economics, ShenZhen University, 3688 Nanhai Ave., Nanshan, Shenzhen, Guangdong, China 518060. E-mail: 2013020431@szu.edu.cn****²Lishu Zhang, Faculty of College of Economics, ShenZhen University, 3688 Nanhai Ave., Nanshan, Shenzhen, Guangdong, China 518060. E-mail: lishu.zhang@szu.edu.cn.
Corresponding author.****Abstract**

Based on the literature summary, it analyzed the factors that affect Chinese college students' behavior of the use of consumer credit using the questionnaire survey to collect data and the chi-square analysis and binomial logistic regression analysis, finds that gender, professional, average monthly income, consumer credit attitude, application process, using process, the security of personal information and funds, peers recommendation and loan term, have a significant effect on the Chinese college students' use of consumer credit. The result gives suggestions to the related parties of college students' consumer credit.

The consumption of Chinese college students has been regarded as a rapid growing market. One reason is that the number of college students in China increased tremendously due to the policy changes in college enrollment in the recent years. According to the National Statistical Bulletin of the Development of Education for 2015, the college students of regular higher education in 2015 were 26.253 million, which is 0.776 million more than those in the previous year [1]. The second reason is that the consumption of Chinese college students is increasing. According to the Blue Book of Chinese College Students (2013), the average monthly consumption made by per Chinese college student in China was RMB945.6 (around \$147 US dollar) ; the annual total consumption of each Chinese students is about RMB11,347 (around \$1,693 US dollar) [2]. In addition, the continuity of consumption is also worth to think about [3]. College students will be the potential group of the future consumer subject.

Therefore, whether from the current number of college students and consumption status, or from the consumption ability of college students in the future, college students' consumption is a field that deserves special attention by the society, school and enterprises.

With the development of internet finance, financial companies of various kinds and consumer credits developed via platforms emerge one after another. They strive to make college students as their profit-making objects. These consumer credits have developed the consumption levels of college students, provided college students with convenience and improved living quality of college students.

What cannot be neglected is that there are many defects in loans for college students, such as naked loans, online payment collectors and usury, etc. These are all disharmonious tones in the development of college student consumer credit.

Currently, college student consumer credit market has undergone a period of rapid growth, but it has faced with more disordered situation. The regulatory authorities have also got involved trying to lead college student consumer credit onto a road of proper development, so the study of all issues about college student consumer credit is extremely urgent.

This article starts from the source of using consumer credit by college students to study the factors affecting college students using consumer credit. By exploring the factors affecting college students using consumer credit, it realizes how different factors affect college students using consumer credit, which will benefit effective instruction to the good development of college student consumer credit markets.

Key words: Chinese college students; consumer credit; influence factors; quantitative analysis

Summary of Literature

According to the sorting and summary of the existing literature, the factors affecting college students using consumer loans are roughly divided into three aspects. The first one is the subject using consumer loans – factor of college students themselves. The second one is the factor of attraction to potential users in respect of the design of consumer loans. The third one is the factor affecting a third party other than consumer loan demanders and providers.

First of all, we start from the discussion about factors of college students as the subject.

Gender is generally accepted as one of variables that are related to the use of consumer credit. Xiao, Noring and Anderson found by chi-square analysis that male students like credit cards more than female students [4]. Hayhoe, by regression analysis of survey data of 2500 college students, found that the gender is one of the significant variables to explain why college students have more credit cards [5]. Based on 1193 copies of questionnaires he collected, the analysis results show that nearly 30% of male students declare that they once used online consumption installment payment, which is 12% higher than that of female students. Moreover, of the college students who did not use online installment payment, 55% of female students did not want to make any attempt, and the proportion of male students who are unwilling to have a try is also lower than that of female students. Seen from these two aspects, male students accept and use online consumption installment payments more easily than female students.

Other variables, such as grade, specialty and registered permanent residence are also found to be significant by some previous literatures. Ye Chunliang made a random survey of regular undergraduates from Hefei Normal University, and after analysis, he draws a conclusion that there is some difference in grades, specialties and registered permanent residence of college students with regard to consumption levels of credit use. The difference in grades is characterized by the fact that senior students at have more credit usage than junior students. The difference in specialties is characterized that students learning arts and physical education have more credit usage than those learning grammar, science and technology. The difference of credit usage observed in students with different seniority and major can be explained by the potential financial knowledge of owned by students. Norvillitis, et.al (2006), by collecting data from 448 students from five campus found that age and financial knowledge are important factors to explain the amount of debt owed by students.

When comparing In respect of difference in registered permanent residence, the credit consumption levels of students from rural areas are higher than those from urban areas [6]. Gu Tianzhu released questionnaires to a great number of regular college students and postgraduate students, and from 551 effective copies of questionnaires, he found that in the fulfillment of consumer credit, there are more students of registered permanent residence than students from rural areas, more senior grade students than junior grade students; in the actual amounts of consumer credit issued, there is the least amounts of consumer credit used by students majoring in science and technology followed by students majoring in farming and forestry as well as art and physical education, but there are the most students majoring in laws [7]. Duca and Whitesell found people living in rural areas have less possibility to own credit cards, but people having received more education are more likely to own credit cards [8]. In summary, in the questionnaire survey, the grades are divided into freshman, sophomore, junior and senior, the specialties are divided into economics and non-economics, and registered permanent residence is divided into rural areas and urban areas.

Thirdly, it is consumption concept. Xu Mingxing believed when he mentioned the factors that may affect consumer credit that consumer credit is actually a kind of behavior in overdraft consumption, which is the betrayal to the traditional culture of making both ends meet in China, but changes in consumption concept need a longer process, especially for some groups of older ages [9]. It is clear that the impact of consumption concept on consumer credits is tremendous and profound. After analysis of 84 effective questionnaires, Zhang Xuanhua has concluded that “the students with independent living awareness, preferring risks and pursuing fashionable consumption have more tendency to consume using credit cards.” [10] In this article, the method for referencing questionnaire surveys and measurement of consumption concept is applied and proper amendments have been made to take independent living awareness, preferred risks, and pursuit of fashionable consumption as the basis for the measurement of consumption concept.

In addition to consumption concept, consumer credit attitude is also proved for several times that it is closely related to the use of consumer credit. Santa referred to consumer credit attitude in the analysis of reasons for credit card debts in universities, and Norvilits regards consumer credit attitude as explanatory variables in the exploration of effect on credit card debt levels, which have been proved in empirical analysis ^[11]. We reference the measurement methods for credit card attitude in Warwick's article to measure the attitude of college students towards consumer credit. Warwick divides attitude into four categories, which are respectively "they are the best things invented by the mankind till now", "if they are properly used, they will be beneficial", "they not good way for financing", and "they are the worst things invented by the mankind up to now" ^[12]. This article divides consumption attitude into positive and negative aspects. It is described as that "they are the best things invented by the mankind up to now, and if they are properly used, they will be beneficial" and that "they are not good way for financing, for there is risk in advanced consumption".

Finally, it is the current income and anticipated income of college students. Credit consumption refers to the consumption using the money in the future. It is also a kind of consumption. However, according to the classic economic theory, consumption is the function of income. In the use of consumer credit, income and anticipated income are paramount influence factors. In the current literature, when the influence factors of consumer credit are referred to, all of them regard income as the first influence factor. Ducaand and Whitesell finds that variables of income and fortune are positive and significant to the effect of credit cards. The men with higher income will have the higher probability to own credit cards. After surveys made to more than 10 colleges and universities in Nanjing, Cui Yaoyun proves that the college students of better financial capacity tend to use credit consumption durable consumer products ^[13]. With consideration taken to the particularity of the group of college students, the current income of college students mainly comes from family provision, but their income sources are rather extensive. In Cui's article, his data show that most of consumed funds of students come from their respective families, but there are some consumed funds come from scholarship or part-time job income. In summary, the current income of college students is listed as living expenses provided by families, scholarship, student grant, part-time pay, internship wages, and financial support from relatives and friends, etc. As the foregoing income can be freely controlled by college students themselves, the foregoing income is listed into the range of current income in this article. With consideration taken to the income privacy of respondents and the fact that questionnaires will be able to lead to more data, and in the light of the current income level of college students, the current income is divided into four levels, which are respectively less than RMB1000, RMB1000-2000, RMB2000-3000 and more than RMB3000.

As anticipated income will enhance the consumption confidence of consumption, this article lists anticipated income as one of influence factors. In the analysis of reasons for credit card debts in university campuses, Santa referred to the high expectation of income in the future. By survey data on 230 college students, Seaward and Kemp find the overestimate of future income is positively relevant to the possession of higher debt levels ^[14]. If students believe that their future income is comparatively higher, then they will have higher tolerance to debts, for they believe that they will be able to repay for debts. Comparison is made subject to the anticipated income after college students' graduation with the current average salary levels of graduates to divide anticipated income into three levels, which are respectively higher than average levels, equivalent to average levels and lower than average levels. According to the Report on the Development of Employment and Entrepreneurship of College Students 2015-2016 in China, the average monthly salary for college graduates in the year is RMB3869. Therefore, RMB3869 serves as the reference figure of the average level.

The design of consumer loans by merchants is another important aspect setting aside factors of college students themselves affecting the utilization of consumer loans for college students.

Firstly, it is the operation simplicity of operation of consumer credits. In the study of the desire of using credit cards, Zhang Jiahong has made analysis of 281 specimens finding consumers believe that the higher easiness for using credit cards, the more number of merchants who swipe for payment, and the more bill payment channels there will be, and the stronger desire they will have to use them ^[15]. By regression analysis, Anhui proves that the easiness of using credit cards will affect the desire of college students using credit cards. It is clear that the simple and easy degree of the operation process of consumer credits is a very important influence factor. The more convenient in application, use and repayment, the more possible the consumers will use them ^[16].

Secondly, it is the security of consumer credit. Zhang Fangfang, Li Li, Liu Jing and Yang Chen apply statistic analysis finding that the security comments and cost comments on credit cards have greater effect on the desire of using credit cards ^[17]. While studying the desire of using credit cards,

Zhang Jiahong found by analysis of 281 specimens that consumers believe there is greater financial risk and privacy risk, so the desire of using them will become lower. An Hui proves by regression analysis that influence factors in the desire of using credit cards by college students include financial risks in credit cards.

Finally, it is the attribute of consumer credit itself. Li Yuji, after using factor analysis based on data on urban residents in Tianjin, found that the product properties of consumer credit are of great significance to the selection and use of consumer credits by residents^[18]. Similarly, Hu Pinglu also applies factor analysis to conclude that the length of term of loans has significant effect on the personal consumer credit demands of residents^[19]. According to the foregoing literature and attributes of consumer credit itself, the influence factors of terms of consumer credit are introduced.

Based on the foregoing literature, this article induces merchant factors as: simplicity and easiness of operation process, including application, utilization and repayment; security, including the security of personal information and capital; and attributes of consumer credit itself, namely, term of consumer credit.

Thirdly, the viewpoints and behaviors of college students can affect or restrict a third party. Marry, by t degree test of specimens, finds that "the greatest role in the credit information transmitted by parents in all channels, including schools, peers and media." Further, "the relevant analysis shows the quantity of credit information provided by parents and significant negative relationship of the use of credit cards. The more information provided by parents, the lower credit card debts due from college students will be", and other channels such as "media resources, education resources, peer resources and the use of credit cards have no significant correlation."^[20] Cui Yaoyun pointed out in his article whether students, who purchase consumable products, will consider credit consumption is obviously affected by user experience of such credit products, and the students with high appraisal by peers will be more likely to consider credit consumption. In this connection, the third party in this article, only two groups like parents and peers are introduced. Factors of parents are divided whether parents use consumer credit, whether parents support the use of consumer credit, and whether parents help repay consumer credit, while factors of peers are divided into whether persons of the same age use consumer credit and whether persons of the same age recommend the consumer credit to you.

To sum up, there are 15 influence factors of the consumer credit introduced by this study, and they are divided into 8 personal factors of college students, 5 factors of merchants and 2 third party factors.

Study Design

For this study, it is required to design survey questionnaires based on the existing literature and relevant influence factors, and to release questionnaire collection data to the great number of college students via questionnaire star platform, and to apply two logistics regression models to explain whether college students use consumer credit.

Questionnaire survey

The issues of questionnaires are divided into status of using consumer credit and influence factors. For the application status of consumer credit, they include "whether to use", "ideal line of credit loans", "ideal way of repayment", and "intended consumer credit purposes", and influence factors are divided into personal factors of credit users, merchant factors as credit providers and third party factors affecting the use of credit. Personal factors include sex, grades, specialties, registered permanent residence, consumption concept, credit loan attitude, income and anticipated income. Merchant factors include application, simplicity and easiness of the use and repayment operation process, security of personal information and capital, and term of loan. The third party factors include whether parents help repay consumer credit, and whether peers recommend consumer credit to you.

Questionnaires are released by Questionnaire Star Platform, and data are collected from college students from different parts of the country for a period of 10 days. In this survey, 1000 copies of questionnaires have been released, with the interviewed college students covering most of provinces across China. There are 524 copies of effective questionnaires, with the specimen effectiveness at 52.4%.

Questionnaire analysis tools and methodology

SPSS17.0 software is used for statistical analysis in this study. First, statistic data are subject to descriptive analysis followed by the application of chi-square analysis to verify the correlation of

influence factors and the use of consumer credit, and finally, regression analysis is made on the factors affecting consumer credit and whether to use consumer credit.

Results of data analysis

1 Statistical analysis of population

From Form 1, we can see that sexes and grades are well distributed, and layout of specialties and registered permanent residence rather comply with the actual conditions in China. Moreover, the distribution of average monthly income is rather similar to the current living conditions of college students. These results show that specimen distribution is comparatively ideal, and the specimen data quality is good.

Form 1 Details of vital statistics of respondents

Variables of features	Type	Frequency (person)	Percentage (%)
Sex	Male	211	40.3
	Female	313	59.7
Grade	Freshman	115	21.9
	Sophomore	122	23.3
	Junior	145	27.7
	Senior	142	27.1
Specialties	Subjects of economics	158	30.2
	Subjects of non-economics	366	69.8
Registered permanent residence	City	281	53.6
	Countryside	243	46.4
Average monthly income	Less than RMB1000	179	34.2
	RMB1000-2000	253	48.3
	RMB2000-3000	58	11.1

2 Statistical analysis of the use of consumer credit

According to Form 2, the college students using consumer credit in the samples account for about 40%. We can see that consumer credit is highly used by college students. In the selection of ways of repayment, most of people believe that repayment at equal amounts on a monthly basis is more advisable; in the selection of terms of consumer credit loans, more than 90% of people believe that the best term should be less than 12 months; and in the field of the use of consumer credit, motors, further study and travel are objects of focus by college students.

Form 2 Details of use of consumer credit by respondents

Variables of features	Type	Frequency (person)	Percentage (%)
Whether to use consumer credit	Yes	206	39.3
	No	318	60.7

Repayment way for consumer credit	Repayment at equal amounts on a monthly basis	434	82.8
	Only repayment of interest on a monthly basis	90	17.2
Term of consumer credit loan	3 months	182	34.7
	6 months	170	32.4
	12 months	132	25.2
	24 months	18	3.4
	36 months	22	4.2
Field of use of consumer credit	Automobiles	216	41.2
	Daily durable products	53	10.1
	Travel	55	10.5
	Further study	123	23.5
	Medical treatment	39	7.4
	Entertainment	38	7.3

3 Analysis of reliability and validity

Commonly used test methods are used for reliability and validity. Cronbach alpha is used for measuring reliability, with the value as 0.737. Based on the concept of Nunnally, when the coefficient is above 0.6, it will be regarded as higher reliability. The KMO value of validity is 0.853. According to the KMO measurement standard given by Kaiser, over 0.8 indicates that appropriate independent variables are suitable for factor analysis. Meanwhile, Barlett spherical test is also significant. In summary, the reliability of the questionnaire survey is very high. Therefore, the effective degree of the following data analysis is comparatively high.

4 Analysis by cross tabulations

Before regression analysis, we have made correlation analysis. As dependent variables and independent variables are classified variables, we apply chi-square analysis. Of college students' personal factors, except p value of sex that is greater than 0.05, p values of other 7 factors are smaller than 0.05, which are significantly related to independent variables statistically. In merchant factors, 5 factors are significantly related to dependent variables statistically. In third party factors, 2 factors are also closely related to dependent variables.

5 Binary classification logistics regression analysis

On the basis of ideal results of correlation analysis, we have carried out regression analysis. In this regression analysis, as dependent variables are binary-state variables, binary logistics regression is used. On the basis of the method for logistics regression, the backward wald gradual regression is used in order to exclude those less obvious variables to have the best equations, and to avoid co-linearity, and to avoid failure to find the existing relationship. The result of regression is set out in Form 3.

Form 3 Result of backward –wald method gradual regression

Variable	B	S.E,	Wals	df	Sig.	Exp (B)
Sex	.469	.217	4.666	1	.031	1.598
Specialties	.557	.228	5.995	1	.014	1.746
Average monthly income	-.293	.125	5.473	1	.019	.746

Consumer credit attitude	.895	.226	15.673	1	.000	2.447
Simplicity of application process	.697	.298	5.471	1	.019	2.008
simplicity of utilization process	.681	.268	6.441	1	.011	1.977
Security of personal information and capital	.818	.345	5.627	1	.018	2.267
Whether peers recommend consumer credit	1.079	.212	25.813	1	.000	2.942
Term of loan	-.219	.102	4.636	1	.031	.803
Constant	-5.831	.880	43.909	1	.000	.003
Nagelkerke R square			0.366			
Hosmer and Lemeshow Test (sig)			2.596 (0.957)			

The results show that 9 factors have entered independent variables, and that sig values of all independent variables are smaller than 0.05, with 95% of certainty to believe that they are closely related to dependent variables. The correlation directions are tested by odds ratios. When they are greater than 1 indicating that independent variables increase, the odds not using consumer credit will increase. We sum up the factors increasing the probability of using consumer credit as follows: positive consumer credit attitude, specialty of economics, male, high average monthly income, high security of personal information and capital, convenient consumer credit application and utilization process, short term of loan and recommended use by peers.

Finally, it is the test of fitness and interpretation of this regression equation. The sig value of Hosmer and Lemeshow Test as a result of regression shown is 0.957. If it is greater than 0.05, the analog fitness result is good. The interpretation of independent variables to dependent variables is measured by Nagelkerke R square. Although it is only 0.366, based on the number of specimens for this test, Nagelkerke R square greater than 0.03 is acceptable. Therefore, this regression equation is rather ideal as a whole.

Conclusion

By the study of existing literature, this article has found the factors of college students using consumer credit, including sexes, grades, specialties, registered permanent residence, consumption concept, credit loan attitude, income, anticipated income, consumer credit application and utilization as well as the simplicity and easiness of repayment process, security of personal information and capital, terms of loans, whether parents help repay consumer credit, whether peers recommended consumer credit, altogether 15 influence factors. After that it designs survey questionnaires followed by the design of related data out of survey questionnaires, and performs chi-square analysis and 2 logistic regression analysis on the basis of the data obtained, with results out of chi-square analysis shown in 95% of reliability. Except sexes that are not so significant, other influence factors have significantly affected whether college students use consumer credit. Then, the backward – wald method is used for gradual regression so as to exclude less significant variables and to and get predicated in order to exclude those less obvious variables, and whether college students are predicted to use the best equation of consumer credit. The factors entering the optimal equation include sexes, specialties, average monthly income, consumer credit attitude, simplicity of application process, simplicity of utilization process, security of personal information and capital, whether peers

have recommended consumer credit, and terms of loans. The fitness and interpretation of this equation is ideal.

According to the study results, the following advice can be acquired.

Firstly, college students should have a correct consumer credit attitude to have a positive understanding of consumer credit, to correctly recognize its role and risk, and evaluate whether to need consumer credit and how much consumer credit is secure as the case may be. Meanwhile, colleges and universities should strengthen financial education for college students, who will be helped set good consumer credit attitude.

Secondly, merchants should try to simplify the application for consumer credit on the basis of guaranteed security of information and capital as well as application process; in the design of consumer credit, consumer credit complying income and expenditure customs of college student groups can be designed, for example, the design of terms may be short-term, say, mainly consisting of 12 months or so in order to increase consumer credit application rate and utilization rate of college students; in marketing to college students, persons of the same age may be made use of by their influential roles among college students. One college student is used to cover one college student group.

The influence factors in this study cover most of factors concerning college students, merchants and third parties, but there are still some other factors which have not yet been taken into consideration. In the subsequent study, more relevant influence factors may be added to strengthen the interpretation of regression equations. On the other hand, as there are more influence factors covered, there are defects like incomplete study of each influence factor. For some factors, we can do further in-depth study, for example, the effect of consumption concept on consumer credit used by college students may be further discussed about to improve the measurement and effect approach of consumption concept.

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