Research on the Negative Problems of Campus Loan Based on Game Theory

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Abstract
As a gradually rising network loan model, campus loan is a convenient and quick fund channel that greatly meets the needs of today's college students and becomes more and more popular in universities. But at the same time, the frequent occurrence of negative problems such as bare loans, bad credit loan cases and fraudulent loans have had a serious impact in the campus of universities and have affected the steady development of schools and the mental health of college students. Under such a big background, this paper set up the game theory model of cooperation and non-cooperation based on the characteristics of internet loan companies and college students to provide the best countermeasure to the negative problems which brought by the campus network loan, and on the basis of this, it put forward the best plan to improve the present situation.

Key words: Campus loan, Best countermeasure, Game Theory

1. INTRODUCTION

With the rapid development of Internet economy, Internet finance gradually plays a more and more important role in people's daily life. The Internet platform for college students' staged consumption has the advantages of low lending standard, simple procedure, convenient and quick, so it meets some of the students "spend tomorrow's money, round today's dream" this advance consumer demand, so make it is sought after. However, this network lending platform also has many problems, such as students are blindly spending ahead of time and bring economic and psychological pressure to them; The phenomenon of the illicit network loan platform’s illegal operation also brings pressure and challenges to the steady development of college students and colleges.

As a model of online lending, campus loan is mainly aimed at college students and graduate students to provide Internet financial services platform such as shopping by stages and advanced consumption. Since 2014, this platform had been explosive growth and the advertisements of various campus loans can be seen everywhere in university campuses. The students of limited income but full of consumer desires became the battleground of the industry. They said, "College students staging consumer market potential, profits thick." The industry is in the brutal growth period now. However, due to the government's lack of a management system for online loans and supervision is not enough, there are various chaos in campus network loans such as non-operating licenses, over-interest payments, suspected frauds and personal information disclosure. Coupled with the lack of self-control of students, often under the purchase of desire to owe a loan after another. A series of negative problems caused by campus loans urgently need to be solved. This paper will analyze the negative problems caused by campus loans by using game theory model, and give the best countermeasure model and propose the best plan to improve the present situation.

1.1. Statistics of College Students' net loan information

In the process of investigating College Students', as shown in Figure 1. 78.15% of the students think that campus loan will make students easy to produce wrong consumption ideas. As Figure 2 shows, 74.83% of students think that college students' campus loan is more harm than good. It can be seen that while students' campus loan has a certain impact on the lives of students, they do make students realize the existence of problems. However, in the net loan and other loan methods, the net loan is quick and convenient, and the benefits of borrowing and loaning are recognized. This is also the source of the double-edged sword enters the world of college students.
Increase spending
Increase the pressure of college students
Easy to produce misconceptions

Figure 1. Network loan on the impact of college students

More good than harm
More harm than good

Figure 2. Advantages and disadvantages of the network

1.2. Current situation of negative problems

With the rise of campus loan, it becomes popular among college students and make it more timeliness. On the one hand, it does bring about convenient turnover for college students and other activities, but on the other hand, there are many negative problems, which bring about many disadvantages and hidden dangers. The development of the problem before the summary in Figure 3:

Figure 3. Status of the problem

1.2.1. Information leak, credit crisis

Although net loan procedures are simple, it involves a lot of personal information, including ID number, student information, family information, personal phone number. And network lending platform can use these information after login. Some unscrupulous platforms have used this personal information for personal gain and sold them to criminals, causing frequent cases of fraud and telephone fraud on university campuses. The core of net loan is credit, which is established on the basis of rational economic man. At present, college students are not sufficiently aware of credit and prone to bad debts. These bad records will affect the credit review of future bank loans. Moreover, because the network loan platform is not perfect related laws of the virtual, once the university students network loan disputes, they will face the problem of no place to complain, it is difficult to safeguard their rights.
1.2.2. Into less than more, caught in repayment storm

Most of the contemporary college students are the only children in the family. From an early age, their living environment is better. Parents also try their best to meet their children's needs so make their children form a wrong concept of consumption. So, when college students face high consumer demand, such as updating the purchase of electronic products, luxury goods and other living expenses outside their own range of things, they turned to the campus network lending platform to launch the so-called interest free loans on their own funds in limited circumstances. However, some students have embarked on a high interest rate owing on the loan. Mainly because these net loans are not as low as they advertised, they often use some zero Shauf, low interest rate false guise to attract college students and cover up their actual high interest rates, high risk. Moreover, some college students lack of financial knowledge, do not know how to calculate the interest, no concern about the state of the relevant interest rate regulation, repeat lending multiple campus loan platform, take the new loan to make up for the old loan, demolish the wall to make up the Western Wall, trap themselves in the repayment storm.

1.2.3. Blind comparisons, naked loans

At present, due to the unhealthy values of some female college students, blind comparisons, abnormal pursuit of high-end electronic products, luxury clothes vanity psychology, without considering the consequences, embarked on the "naked loan" of the road of no return. In November 30, 2016, from the "debit and credit treasure" spread the memory of up to 10G of "naked loan" compression package spread crazy online, once again refresh people's moral bottom line, causing great attention of the majority of people. The so-called "naked loan" refers to the female students with hand ID card as security conditions, so as to obtain the loan in the network lending platform. If this "naked loan" unable to pay principal and interest, the platform will choose to open your nude or put these photos to someone close to you, as a threat to your repayment.

1.2.4. Suffer personal safety threats

Due to not timely repayment, some bad network lending institutions will conduct some illegal chase behavior, so that college students are threatened. The loan lending platform will record your personal information, such as home address, when you do not repay, they can be an easy to find you, even some unscrupulous platform will supervise you, threaten you to do some illegal things, threatening the personal safety of students. College students lack their own awareness of rights protection, and they will not pursue themselves for these illegal acts, resulting in varying degrees of loss to college students.

1.3. Cooperative and non-cooperative game theory in the negative problem analysis of the best strategy model

This section mainly focuses on the application of cooperative game theory to college loan users and net loan companies. By establishing a cooperative game model and exploring equilibrium solutions, this section reveals the cooperation, which can bring the entire benefit under any conditions as compared with the non-cooperation Expect to see how the interests of both parties can be balanced in the economic division of labor and cooperation from a game perspective. Cooperative game theory in the discussion, the more partners, the more complicated the discussion, which, in order to discuss cooperative game theory, more convenient.

1.3.1. Non-cooperative game theory

In the non-cooperative game, the most typical than the Nash equilibrium. In the Nash equilibrium, the typical three cases are: prisoner's dilemma, Chi pig game, coin positive and negative. The final conclusion in all three cases is the same: making the best choice for yourself without knowing anything about each other is maximizing your own interests.

Here, assume that the net lending companies to users lend two results, you can recover the principal and interest and remedial classes to recover the principal and interest. Students registered under the college students can be set from the use of network loans (relative to other loans) to save the economy as S, Net bag company to recover the funds interest is \( \alpha \), non-recoverable capital interest is \( \alpha_2 \), unit net credit items idle resources loss A, lending is \( F(\alpha) \), the corresponding The number of idle loans per unit of time is \( \varphi(\alpha) \), so net loan companies to obtain profits:

\[
C = F(\alpha)\alpha - \varphi(\alpha)A
\]

(1)

Students registered users can benefit from it

\[
W = (S - \alpha)F(\alpha)
\]

(2)

There are several situations in which the government will make a choice. See Table 1 below for details:

<table>
<thead>
<tr>
<th>Profit</th>
<th>Network credit company</th>
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<tr>
<td></td>
<td>Withdrawal of principal and interest</td>
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| College student | \( W_1, C_1 \) | \( W_2, C_2 \) |

Among them,
\[ C_i = F(a_i) * a_i - \varphi(a_i)A \quad i = 1,2 \]
\[ W_i = F(a_i) * (S - a_i) \quad i = 1,2 \]

In the non-cooperative game, for the net loan company, regardless of whether the college students can repay the principal and the interest, the net loan company will release college students a certain amount of loan meeting the application conditions from their own interests. As can be seen from the table, there are \( C_1 > C_2 \) loans and unused items. Therefore, in order to ensure their own interests are maximized. In real life, the frequent occurrence of net loan companies will easily release a large amount of loans, net loan companies and college students registered users for the \( (W_i, C_i) \)

However, it can be seen from the results that the loan-to-loan ratio for college students is very high, but the non-repayments will bring about the problems of interest of both parties, resulting in a series of negative problems. As a result, the profit of net loan companies will be reduced and the loan repayments impossible Part of the body and mind of college students can also cause harm, we can see that a deeper understanding of the importance of the market, the need to resolve the interests of both sides.

1.3.2. Cooperative game theory

The subject of the cooperation game focuses on the long-term interests, due to the requirements of borrowing for college students and because of the negative problems arising from lending cannot be completely eliminated, net lending companies cannot solve the problem in a short period of time, but also for those who cannot repay the funds nor Substantially effective method. However, when the loan is issued for a long time, the net loan company cannot, for a long time, choose uncontrolled payment regardless of whether it can repay the funds or not. This article focuses on the net loan companies and college students registered users of the cooperation or not on the overall economic benefits, and then find the game equilibrium solution, and thus to amend and guide the cooperation between the two to effectively enhance the efficiency and effectiveness.

The cooperation between the two parties refers to the voluntary cooperation between the two parties. It is assumed here that the overall benefit of the supply is:

\[ Y(a) = C + W = F(\alpha)\alpha - \varphi(\alpha)A + F(\alpha)S - \alpha \]  

(3)

Seeking partial derivative of \( \frac{\partial Y}{\partial a} \).

Let \( \frac{\partial Y}{\partial a} = 0 \) solve the corresponding \( a \) value of the size of \( a_0 \). At this point, the solution of \( a_0 \), respectively, said the cooperation, the net loan company \( a_0 \) loan price to the maximum amount in order to ensure the interests of both parties to maximize.

1.3.3. Non-cooperative game model and cooperative game model analysis

From the two models mentioned above, the profit combination of non-cooperative game model is \( (C_i, W_i) \), and the profit combination of cooperative game model is \( (C_0, W_0) \). From the overall revenue of the supply chain, the yield gap between the two is:

\[ \Delta Y = C_0 + W_0 - C_{11} - W_{11} \]  

(4)

As the cooperation between the partners can bring about an increase in revenue is already an undeniable fact, there will be \( \Delta Y \geq 0 \), but at the same time there will be a net lending company's income increased by \( \Delta Y(\alpha) \geq 0 \), the registered user's income reduced by \( \Delta Y(\alpha) \leq 0 \).

Learned from the above: the cooperation between the two sides will make the net loans to increase the company's income, and college students registered users of the income reduced, this for a one-off network credit companies and college students registered users of the cooperation, net lending companies are willing to, and college students registered users are unwilling to cooperate. In other words, the outcome of this game cannot be balanced.

1.3.4. Implementation Conditions

According to the theory of game equilibrium, the following conditions are needed to obtain the equilibrium solution of the game between producers and sellers in supply chain:

(1) To promote cooperation between the two parties requires a certain incentive mechanism, that is, the results of the cooperation between the two sides should be better than the results of the cooperation, or a certain amount of compensation for the disadvantaged Parties to facilitate cooperation.

(2) The two sides still need to continue to cooperate in the future economic activities, the sharing of bicycles will be put into use for a long time, and the government should make concessions in order to achieve
long-term cooperation so as to achieve the benefit of both sides. Therefore, the choice of cooperation with the other side is not only focused on the future long-term interests, but also the demand for cooperative game.

1.3.5. Cooperative Game Equilibrium

For the net loan company, because \( C_2 < C_1 \), the university student user chooses "does not cooperate" strategy. For college students registered users, because \( W_1 > W_2 \), the network loan companies choose "not to cooperate" strategy. These are decisions based on their own interests, and the Nash equilibrium for this cooperative game is: (No cooperation, no cooperation). The only Nash equilibrium solution is the (cooperative, cooperative) strategy, which shows that when there is only one game, the two sides will not choose to co-operate because it is advantageous to them.

It can be realized that when the net-lending company to compensate for the loss caused by the cooperation of university students, the two sides will choose to cooperate.

Assumption: Compensation for registered users of college students by net-lending companies is \( x(x \geq 0) \) and \( x \) should be less than or equal to the net loan company to cooperate and increase the benefits, namely: \( x \leq \Delta Y_2(a) \); for the net loan company, \( x \) is greater than or equal to the benefits of the reduction of cooperation, namely: \( x \geq \Delta Y_1(b) \), then there are: \( \Delta Y_1(b) \leq x \leq \Delta Y_2(a) \).

Second assumption: Parameter \( \theta \) is the compensating coefficient, \( \theta \) satisfies the uniform distribution of \([0,1] \), and it indicates the degree of compensation of the registered users of the net-loan company to the university student, has:

\[
x = \theta \Delta Y_2(a) + \Delta Y_1(b)
\]

NET lending Company's new revenue: \( C^* = C - x \). And the new income of college students registered users is: \( W^* = W + x \).

The model embodies the possibility of cooperation between the two sides, that is, cooperative solutions. In fact, the compensation behavior of producers has laid a firm foundation for the cooperation between the two sides.

2. PROPOSING THE BEST IMPROVEMENT SCHEME BASED ON GAME THEORY

2.1. Game improvement Scheme for college students ' registration and net-lending companies

In the non-cooperative game to find the problem, and to find a win-win situation in the cooperative game. Through the analysis of game, on the one hand, the net-lending company should take into account its own interests while making loans to college students, rather than releasing them without restraint. Considering the free margin of loan items while lending and let the company's practical policies play a key role in protecting the interests of both sides. On the other hand, for the students to consider their own interests and their own economic affordability, as shown in Figure 4, a measure of the student's ability to repay is observed. What can give to students is to loan according to your ability. Identify your current situation, have a sense of responsibility and can serve as the burden of repayment of principal interest.

![Figure 4](image-url) Different living expenses students unable to repay the practice
Both the net loan company and the university student registered user must obtain the common development and achieves the benefit maximization in the correction of their own development at the same times. Try to minimize negative issues and reduce the frequency of negative problems. In this process, find the necessary conditions for the long-term cooperation and the actual environment.

2.2. Multi-party collective advice
In order to improve the college students’ consumption consciousness, standardize the consumption behavior of college students, and avoid get into the trouble of bad net loan, the school, as a place to train and manage college students, needs to guide students’ healthy consumption and create a harmonious campus with parents and society.

2.2.1. As a student
Today’s college students online consumption is significantly higher than offline consumption in the high-speed development of internet economy, and businesses from time to time to carry out promotional activities, the face of favorite products, preferential prices, college students will lose their reason to buy crazy, will not go thinking about if this thing is really need and whether it is in the range of sales I can afford, when their pockets cannot meet the consumer desire, then the goal is diverted to the net loan. So, college students must be rational consumption, seriously consider the need for their consumption, resist the pretense of price concessions and to cultivate healthy consumption concept. Now college students should also continue to learn financial knowledge, network security knowledge, to avoid being deceived; as girls, but also learn self-respect, refuse to compare.

2.2.2. Strengthen the exchange of "home-school education" and grasp the actual situation of students
The child’s consumption concept will be affected by the family, so parents should set a good example to guide the child to establish a correct consumption values. In addition, the school should pay great attention to the phenomenon of campus network loan, and actively guide students’ awareness of risk prevention and strengthen their education and guidance work. As a transfer station for students entering the society, the university should pay attention to cultivating students’ awareness of risk and honesty. Through the discussion with students and the study in class, to help the students to establish a healthy consumption view. At the same time, we can form a "home-school common education" platform, through feedback from both sides to understand the daily situation of students’ consumption, and based on feedback to predict whether the students may be able to advance consumption through the net loan, and then education for different situations.

2.2.3. Establish the supervision mechanism of non-performing net loans and strengthen the supervision
At present, the laws and regulations on internet lending in China are not perfect, and the regulatory mechanism is not mature yet. There are also various lending platforms on the internet. these platforms can also evade the supervision of laws through certain computer technologies. Therefore, the government departments should work together with the judicial and financial departments to improve the relevant legal system, provide legal protection for the loan groups and students. At the same time, the business sector should also conduct daily checks, whether there is an illegal network loan platform, whether the operation of the platform is meet the requirements, so as to optimize the network lending market. Relevant departments should monitor the network loan platform for the review of customer, the implementation of real-name certification system, the establishment of customer trust level, from all aspects to consider the repayment capacity of college students, and limited to provide only small loans, and inform the actual borrowing costs. Only in this way can the realization of the network lending platform to standardize further.

3. CONCLUSION
The campus loan is an Internet financial service platform that provides services for college students such as staging and advanced consumption. Campus network credit really into the life of college students has brought a lot of negative influence, thus, the problem-solving solutions to improve the issue is particularly important. Through the analysis of game theory model, this paper grasps the relations of cooperation and non-cooperation between the registered users of net loan companies and college students, and finds the trend of common development. By analyzing the interests of registered users of net loan companies and college students, the corresponding solutions are obtained, and the strategies to deal with the negative problems are given respectively. With a view to describing the different levels of society through coping programs, so that campus network credit has a more pure and safe environment.

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