Dynamic Analysis of Investors' Behavior in Public Crowd funding

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Abstract: Public projects generally exist financing difficulties, crowd funding as a new Internet financial model, provides a new way for public projects. In this paper, we select the public crowd funding project called "Ruijiexunzi" in the Chinese crowd funding website to explore the dynamic behavior of supporters. The study founds: The increase in the number of supporters presents a U change during the project financing period. In the early stage of the project, the number of supporters increases with time, and in the later stage of the project, the number of supporters decreases with time, and decreases on the last day. In addition, in the process of financing, the investment behavior of supporters has obvious herd effect.

Keywords: public crowdfunding; supporters; investors' behavior.

INTRODUCTION

In recent years, public welfare activities in China have gradually won more and more supports and recognitions, and the development momentum is great. But at the same time, the financing of non-profit organizations has become increasingly prominent. Public activities urgently need a more extensive and supportive fund-raising model. The rise of public crowd founding provides new thoughts for public projects to raise money. The public crowd founding is a way to raise money relying on the Internet. Because public crowd founding and public raising itself has a natural fit, they are both through the identification of ideas, to gather strength and resources, finally realize the dream. The developed Social media, the network portal and platform, are changing our lifestyle, meanwhile they are gradually changing the development of the field of charity. With the changes of support , from cash to bank transfer to the third party payment, the establishment and perfection of network donation platform bring great convenience for the public participation in public welfare establishments. The old way of donation slowly fade out of people's vision, public cowed funding opens a broader space for the development of public organization.

In this context, many small and medium-sized public organizations turn to network crowdfunding platform , they hope obtain competitive advantage through this way, the development of public crowdfunding undertakings brought more market competition. If the public crowd funding projects want to get the support of investors, investors need to have some idea of public project approval. The emergence of crowd funding connects the investor who want to help others with the public projects, eliminating the information asymmetry between project initiators and investors. So the crowd funding has aroused widespread sympathy and recognition of the public. Based on the above background, this paper chooses the project called "ruijiexunzi" which had the maximum amount of financing as sample, then analyze the dynamic characteristics of investment behaviors, in order to put forward valuable experience for public crowdfunding projects.

LITERATURE REVIEW

Public crowdfunding research report in China, 2015 proposed that public crowdfunding is a kind of public investment. The crowd funding has raised the market value of verification, it can make the high quality of public projects and public organizations show themselves. The analysis report of the public crowdfunding projects' characteristics pointed out that the project must provided returns for investors (currently non cash or equity), so the investor service requirements became higher, compared to the traditional mode of fund-raising. The academic research for the public crowdfunding are mainly research on the model of financing [1]; the financing risk [2] and the decision mechanism of investors' behavior of public crowd funding. In the study of the financing model of public crowdfunding, scholars generally believe that the reward-based crowdfunding are the most valuable.

In the study of public crowdfunding risks, most scholars consider that the non professionalism of investors is the main reason for their unexpected

returns. In the study of behavior decision of the public crowd funding, sheep-flock effect (the motivation of investors depends largely on the current financing and the investment behavior of others), the information effect and the public factors in the success of the project are the research focus.

Herzenstein proposed that the motivation of new investors to participate in the investment has a positive correlation with the amount of investment [3]. investors tend to pay attention to other investors [4]. Influenced by other investors [5]. We know that although some scholars have analysed some factors that affected investors' decision-making behaviors with the empirical method, but there is little research on dynamic behavior of investors. Ye Fang and Du Zhaoyun used game model with two stages to analyze the investors' dynamic behavior of public crowdfunding platform, but they only established the theoretical model and lacked empirical test [6].

There are some scholars research the operation mechanism of public crowdfunding by building the theoretical model from other angles. Belleflamme based on the theory of price discrimination, compared the pre-sale public crowdfunding and equity-based public crowdfunding, analyzed the influence of the initial capital requirements and the size of the market on the public crowd funding mode [7]. Rubinton and Errunza regarded the public crowd funding as an evolution of the disintermediation of investment banks, and constructed a dynamic game model under discrete time [8]. Guo Xinru used the two-sided market theory to construct the public crowd funding competitive platform Hotelling model [9]. This paper chooses the public crowdfunding based on the advance sale as object, At present, this kind of public crowdfunding is more popular in China, and the existing literature analysis of its operating mechanism can provide a reference for all domestic public crowdfunding platform.

This paper uses the ideas of Kuppuswamy and Bayus for reference [10]，based on the case called "ruijiexunzi", the project investment is called the supporters, case analysis and empirical research method are used to analyze the investment behavior of supporters over time, in order to provide advice for the project sponsor to design the public crowdfunding projects and to attract investors.

CASE INTRODUCTION

The main purpose of the project called "ruijiexunzi" is to help the lost children go home early through face recognition technology [11].Owing to incomplete statistics, the number of lost children in China is as many as 200 thousand per year, while the rate of successful retrieval is only 0.1%.Because the

project closely linked to social issues, the audience is widely, so it is currently raising the largest amount of public projects. The project lasted four months, won the support of 1077 investors, access to financing amount of 1052576 yuan. Its activities were initiated by the Zhengzhou Ruijie Media Network Technology Co. Ltd., the original intention of its project is to change the situation that successful rate of lost children in China recovered very low. The return rate of lost children in the United States has risen from 62% to 97.7%, and the number of missing children has been stay at around 10 people. The reason for the success of the United States is that they have successively established the Protection center for missing and exploited children (NCMC), the Adam warning system (Code Adam) and the Amber Alert system. The combination of these three systems, both in space and in time, has made all-round protection for lost children. Therefore "ruijiexunzi" project want to help the lost 99.9% children to establish a set of perfect system in China, let them go home early, so they develop "ruijiexunzi system" according to the public crowdfunding.

The project introduced six modules solutions to investors. Firstly, to establish a national database for missing children, as well as a national library of biological information for children (similar to NCMC).Parents of missing children can establish information files about them, including their photos and lost information. Parents of children who are not missing can also establish children information files and update them regularly. If the child encountered an accident, they can publish missing children information through the "ruijiexunzi" platform. Information database not only contains the basic information of children, but also includes biological information for children, such as facial features, voice, fingerprint, pupil and DNA information. Secondly, to open the major social platforms, publishing lost information for children. When the child lost, through the "Ruijiexunzi" APP can quickly release lost children information, and spread the information to major social platforms. When you update your child's information later, the information that has been diffused will automatically be updated to the latest status. After the child has retrieved, parents can cancel the information by one key, guaranteed that the information can not appear the wrong dissemination situation.

Thirdly, through facial recognition and other biological technology, matching lost children and positioning wandering children."Ruijiexunzi" system platform and APP use the world's most accurate face recognition technology, can quickly identify photos and information that users upload, by comparing the missing children information database. So the project can provide more clues for parents looking for children. Later stage through the late fingerprint, voiceprint, pupil

and DNA recognition technology to improve the accuracy of information contrast. Fourth, to make the "Ruijiexunzi" platform build automation platform, as far as possible to reduce manual intervention, to ensure that 7*24 hours work. Through cooperation with Alibaba, seven cattle, Face++ and other outstanding cloud computing companies, the platform will be built into an automated platform. From pictures uploaded to facial analysis, from the release of lost children information to the cancellation of the proliferation of information, the entire platform to achieve automatic operation, to prevent the impact of human intervention on the system. Fifth, to excavate suspected lost children information and locate suspicious person through large data analysis, providing clues for parents, public organizations and government functions. The last plate is called on all public places in the country to implement the "Adam alert" system as soon as possible, With the operators docking, the joint formation of "security alert" system. And cooperation with various public organizations, open API under the premise of protection of user privacy. At present, several companies have agreed to operate the Adam alert system internally. Ocalone will become the first large-scale stores support "Adam alert" in our country, Network mobile decided to cooperate with Ruijie access security platinum alert system.

"Ruijiexunzi" project not only has a full range of services, but also set up corresponding returns for investors. Network mobile as the country's first security alert platinum to install virtual operators, will provide support as the return of supporters, supporters can get the prior option of network letter mobile customized number. At the same time, supporters will receive network letters mobile love rewards, if the supporter is mobile user, he can get a different amount of traffic gifts, and participate in charge calls privileges

The "Ruijiexunzi" project can raise the largest amount of public project, because of it's unique advantages. First of all, the starting point of the project is to keep abreast of the pulse of the times. There are as many as 200 thousand lost children in our country each year, and the rate of successful recovery is only 0.1%. This figure affects the sense of crisis in most families. Moreover, after China carry out the policy of "two children", the number of children in the future will continue to increase, and the awareness of the protection of children in each family will be unprecedented. Therefore, the public projects to search for lost children can easily to meet the needs of most investors. Secondly "Ruijiexunzi" project has a unique scientific and technological support. Unlike traditional public projects supported by manpower and love, "Ruijiexunzi" has combined with the most advanced technologies in the world to make investors feel closer to the realization of the project. For example,

"Ruijiexunzi" in the early days of the public crowdfunding has already been completed the development and debugging of this part through the interface provided by domestic professional team Face++.In addition, it also cooperated with the big SNS social networking platform , has completed docking with the QQ space, Sina, micro-blog, WeChat circle of friends. Investors are concerned about the social benefits of the project when they focus on the public raising projects, and stimulate the motivation of investors. In the end, the whole project will be open and transparent, which will enhance the confidence of investors. The project is open to undertake public scrutiny of all expenditure items within the 2 months after the success of the project, and regular financial statements will be pushed on public accounts. Open and transparent behavior greatly enhance the credibility of the project, and also make investors dare to invest.

THEORETICAL ANALYSIS AND RESEARCH HYPOTHESIS

The public crowdfunding is a kind act that supporter build good deeds of charity through the Internet, their behavior shows very strong prosocial. Prosocial behavior is also known as positive social behavior, namely, sharing, cooperation, sympathy, humility, mutual assistance and so forth in common social life. Prosocial behavior is often the basis for the benefit of others and the maintenance of good relationships in interpersonal communication [12]. Prosocial behavior essentially reflects the relationship between self and others, and reflects the relationship between individuals and society or groups. Prosocial behavior usually takes place in interpersonal activities, taking into account individual interests as well as other people's benefits. The two are taken into consideration by actors. Previous studies have systematically analyzed two typical characteristics of voluntary prosocial behavior: (1) bringing benefits to others; (2) making the relationship between the two parties more harmonious [13].

Supporters of public crowd funding have a strong prosocial social motivation to help people when they believe that support behavior can have a positive impact on them. And they think their financial support will have a more important impact when the project approaches its intended goal. Therefore, this paper makes hypothesis:

H1:When the accumulated funds of "Ruijiexunzi" project closer to its goal, supporters' support will become higher.

When the project sponsors design returns, usually according to the goal of financing to make reasonable arrangements, but as a public crowd funding project, the return number is limited. When the project

reaches its funding goal, high returns are often issued, the trend of support of investors will downward. At the same time, there is goal-gradient effect in the process of project financing. That is, when the project financing is about to reach its target, it is easier for the supporters to invest, because the investment of the supporters is more successful at this time, and they think it is the success of the project because of their own reasons. Once the project becomes successful, the goal-gradient effect will disappear, and then the support rate of the project will decline. Many studies have shown that there is a social network effect in public financing, that is, some supporters are members of the project sponsors' family, friends or relatives and other social networks. These members of the social network will only provide support when the project financing is unsuccessful, especially in the early stages of the project, and the investment will be reduced once the project is successfully funded. Therefore, this paper proposes the hypothesis :

H2: After the "Ruijiexunzi" project meets funding goals, funding support will decrease.

RESEARCH DESIGN
(1)data sources and sample selection
This paper uses the web data capture method to select the "Ruijiexunzi" project which had highest fundraising amount in crowd funding website. And this paper uses the supporter data from July 2016 to October 2016 this four months. This paper analyses the dynamic characteristics of the investment behavior of supporters. The project is divided into initial, intermediate and end stage, so the first 7 days of this paper as the initial stage of the project, the last 7 days as the end of the project, the interim as a reference.
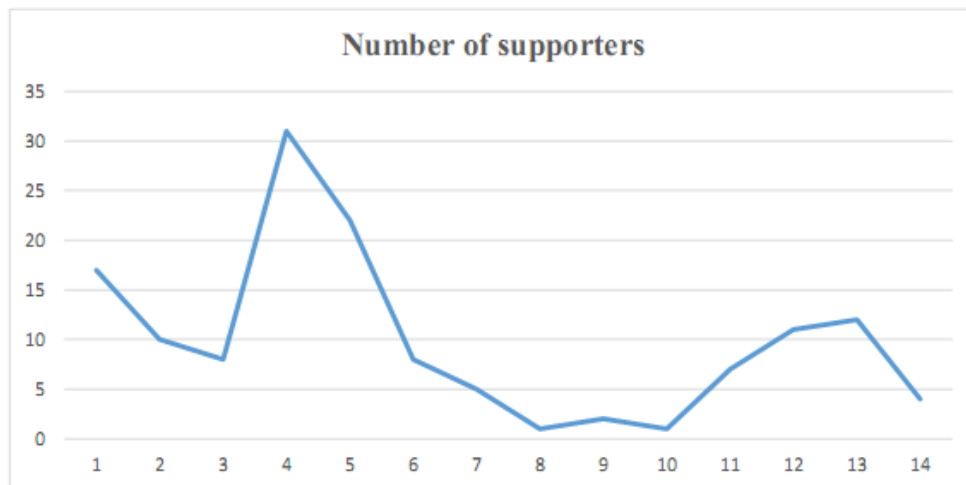
EMPIRICAL RESULTS AND ANALYSIS

Fig-1: the changing trend of the number of supporters over time
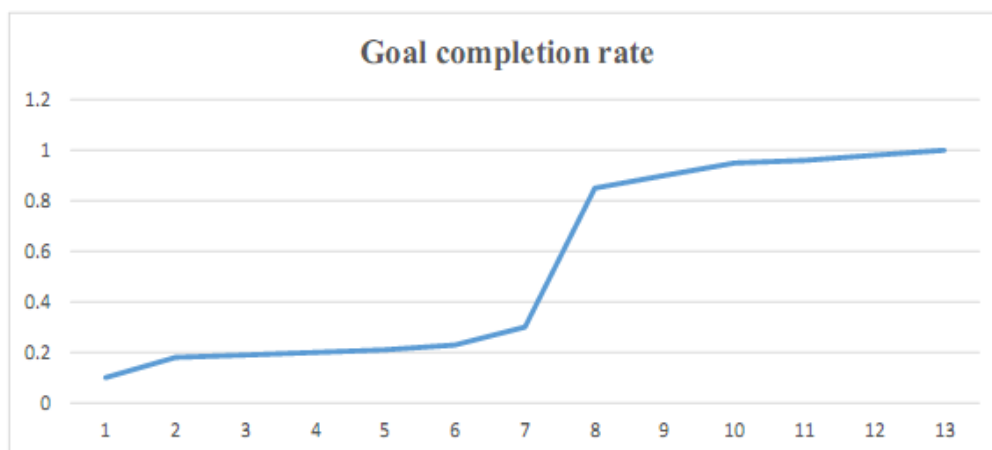

Fig-2: trend of goal completion rate over time

Figure 1 and Figure 2 are the variation trend of the increase number of supporters and the target completion rate, in the two figures we use the number 1 - 7 respective project began 1 to 7 days, with the

number 8 and 14 separately represent the project ended the countdown seventh day - last day. We can see from Figure 1, the number of supporters change over time is roughly U characteristics, namely in the beginning of project, the number of supporters will decreases over time, and in the later stage of the project, the number of supporters will be increased with time, which is consistent with the hypothesis of H1.This is mainly because the project last later stage, more and more people begin to pay attention to this project, the herd effect appeared. People are more inclined to invest those will be completed and others concerned about. More precisely, the investment behavior of supporters were small U type trend will decline at the end of the day, this is because the project financing objectives have been completed in roughly the last second days (Fig. 2), because the target gradient disappeared, the number of supporters declined. This agrees with the hypothesis 2 When the project is expected to reach its goal in the last second day, people feel that their contribution rate will decline, so they will hesitate to invest. In addition, as can be seen from Figure 2, similar to the U type of increase in the number of supporters, increase the amount of support of the U type characteristics, namely in the beginning of project, the target completion rate of growth will decline, while in the later stage of the project, the target completion rate of growth will increase, and the last day declined. Finally, figure 1 and 2 show that although the average duration of the project is 6 weeks, 70% of the money was raised in the first 1 week and the last 1 week, so it is meaningful to analyze the dynamics of the behavior of supporters over the two weeks. And public crowd funding projects should pay full attention to these two time periods, increase the publicity of these two time periods, set scientific expectations, and strive to make good use of these two prime time segments to achieve the expected objectives of all projects raised.

CONCLUSIONS AND RECOMMENDATIONS

This paper analyzes the dynamic changes of supporters' investment behavior by collecting the related data of the online public crowd funding project called "Ruijiexunzi". The study found that the number of supporters change over time is roughly U characteristics, namely in the beginning of project, the number of supporters will decreases over time, and in the later stage of the project, the number of supporters will be increased with time and will drop on the last day. In the stage of raising funds, the target completion rate is higher, the number of supporters will become more, the investment behavior of supporters has obvious herd effect. In the light of the practice of public crowdfunding, this paper puts forward some suggestions as to the practice of financing innovation of public projects in our country:

Public crowd funding provides a new financing channel for creative projects. It's a part of the solution project of public access to credit financing difficulties from banks and other traditional financial institutions to provide a broad space for its development, it also encourages some creative people to actively carry out public activities, which is conducive to promote the development of the public welfare. From the above conclusions, we can see that the investment behavior of all the project supporters is mainly affected by the herd effect, This reflects the financing model of outstanding asymmetric information, the public should raise the platform for the project information review efforts, the government should also introduce relevant policies as soon as possible to protect the interests of investors. In addition, sponsors of all projects should set reasonable expectations.

As the investment behavior of all the project supporters mainly occurred in the early and late stages of the public raising, therefore, in order to attract investors' attention to the utmost, the project sponsor should not set too long the fund-raising days. In fact, a number of studies have shown that there is a negative correlation between project duration and project success[13].In practice, the project sponsor should reasonably set the days of financing and financing objectives, and strengthen the publicity of the project in the early and late stage of the project financing, and update the project information in a timely manner.

The good operation of the public crowdfunding platform is mainly dependent on the application of information technology. The promotion of information analysis and processing ability can effectively solve the problems such as credit evaluation of all sponsors and risk evaluation of all projects raised, and then effectively build social credit system. At the same time, cloud computing and cloud storage as the representative of the big data analysis techniques, their development is helpful for multi-source heterogeneous information extraction, data mining and information value, information on the platform project to enhance rendering capabilities, improve the efficiency of getting information, enhance the investment confidence of supporters.

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