

# Research on Risk Evaluation and Risk Response Strategies of Chinese Internet Public Welfare Crowdfunding Based on Analytic Hierarchy Process

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**Keywords:** Analytic Hierarchy Process, Risks of Internet Public Welfare Crowdfunding, Risk Evaluation, Risk Countermeasures.

**Abstract:** Internet-based public welfare crowdfunding is a new fundraising approach in China that blends Internet finance with traditional public welfare crowdfunding. Its fast growth, however, it is accompanied by enormous hidden risks. Consequently, it is essential to identify and prevent various crowdfunding process related risks. By categorizing and summarizing the risks associated with Internet-based public welfare crowdfunding in China, this study uses the Analytic Hierarchy Process to determine the overall ranking of risks and recommends solutions.

## 1 INTRODUCTION

The notion of Internet finance has been popularized in China with the development of "Internet +" and has become a hot topic in entrepreneurship, investing, the economy, and other industries. As an example of a typical Internet finance model, Internet public welfare crowdfunding has grown quickly in recent years. It is an innovative financing model that blends Internet finance and online charity. Internet's benefits can facilitate the financing of several organizations and individuals.

Currently, the Ministry of Civil Affairs of China has designated 32 Internet-based fundraising information portals for non-profit organizations. Among these, the most well-known are Waterdrop, Love chip, and Fun in funding, which provide the public with an increasing number of direct avenues to donate to charitable causes. In recent years, however, concerns such as "gaining money" and "fraudulent donations" have made Internet public welfare crowdfunding a focal point of scholarly interest. Lin and Li worried that Internet-based crowdfunding platforms may become complicit in unlawful

fundraising (Lin, 2016); Yuan feared that China's public welfare crowdfunding has raised social doubts due to a lack of rules, protocols, and management (Yuan, 2017). In Internet-based public welfare crowdfunding, there is intentional exaggeration of project propaganda, misappropriation of fundraising, inconsistency of returns with promises, and a lack of inspection of fundraiser access information and stringent oversight in the project's final stages. These issues raise the risk of financing, erode the trust of Internet users, and have a negative effect on the long-term growth of Internet public welfare crowdfunding. Consequently, it is vital to examine the risk identification and risk response strategies of Internet-based crowdfunding for public welfare.

Using the AHP technique, this research categorizes potential Internet public welfare crowdfunding risks in China and creates a risk hierarchy model for Internet public welfare crowdfunding. Through the calculation, the overall rating of each risk is determined, and several coping solutions are offered based on the risk's significance, in order to assist the future development of Internet-based public welfare crowdfunding in China.

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The remainder of the article is structured as follows: the second part is devoted to the classification of risks, the third part is devoted to the Analytic Hierarchy Process, the fourth part is devoted to the risk response plan, and the fifth part is devoted to the conclusion and illumination.

## 2 CLASSIFICATION OF RISKS

There are a variety of elements that influence the risk of Internet-based crowdfunding for public welfare. Before analyzing the origins and shifting tendencies of Internet public welfare crowdfunding risks, it is vital to scientifically categorize them. In this study, Internet public welfare crowdfunding risk is categorized into four B-layer risk factors: legal risk, credit risk, audit risk, and platform security risk. Further classified into 10 C-tier risk categories are the B-tier risk factors.

### 2.1 Legal Risk (B1)

Li discovered that the majority of legal risks in over-the-counter transactions were caused by the legal lag resulting from financial innovation (Li, 1999). As a new type of financing, the legal risks associated with Internet public welfare crowdfunding can be separated into three groups.

#### 2.1.1 Industry Standard Risk (C1)

Industry standards are standards developed for technical requirements that do not have national standards but must be harmonized within a country's industry. The research of Dai (Dai, 2021) indicated that industry standards have a normative and guiding role for the entire industry and serve as a benchmark for determining if the project process is compliant. In 2017, the Ministry of Civil Affairs of China promulgated two industry standards, "Basic Technical Specifications for Internet Public Fundraising Information Platforms for Charitable Organizations" and "Basic Management Specifications for Internet Public Fundraising Information Platforms for Charitable Organizations", which provide a technical level for the requirements for Internet fundraising platforms but lacks the elaboration of the ethical aspects of the industry. These immature industry standards threaten the growth of Internet-based public welfare crowdfunding.

### 2.1.2 Legal and Regulatory Risk (C2)

Presently, China's Internet crowdfunding financial supervisory laws are extremely limited, particularly in the part of crowdfunding for public welfare, and the only known relevant legal basis is mainly the "Charity Law of the People's Republic of China." The law controls only nonprofit organizations and does not mention internet crowdfunding platforms for public welfare. Due to the lack of clarity surrounding the legal status of Internet-based public welfare crowdfunding platforms, academic and judicial circles have not established a uniform criterion and criteria for their legal status. Consequently, the absence of laws and regulations in this sector is also among the most significant risks.

### 2.1.3 Supervisory Body Risk (C3)

It is also challenging to identify the primary regulatory authority for the industry in the absence of clear laws and regulations. Currently, the platform, which has a sizable fund of fund operation power, is in charge of fundraising funds, allocating funds, and conducting fundraising activities in the industry. Once a crowdfunding initiative goes awry, it is challenging to recover the losses of the donors' difficult investment without the supervision of a clear regulatory body.

### 2.2 Credit Risk (B2)

Credit risk mainly refers to the problem of information asymmetry presented by seekers and the platform's inability to sufficiently review information in the process of public welfare crowdfunding via the Internet, collectively referred to as credit risk.

#### 2.2.1 Information Asymmetry Risk (C4)

An efficient information bridge between the donor and the seeker must be constructed for Internet public welfare crowdfunding, although there are frequently some issues with information asymmetry. The seekers may be able to pay for the medical expenses themselves, but they haven't told the platform or haven't told the truth, and it's hard for the platform to confirm this. As a result, it will mislead the donors and undermine faith in online public welfare crowdfunding.

#### 2.2.2 Censorship Risks (C5)

There are risks associated with platform censorship as well. Due to the platform's inadequate information review of online public welfare projects, many

materials and even personal information needed for fundraising have been altered and tampered, which has caused to the dissemination of misleading information. In addition, some crowdfunding projects that are true but fall short of the fundraising standards can be approved since the standards for information review are not strict enough.

### 2.3 Audit Risk (B3)

Another major risk, which may be broken down into internal control risk and auditor professional ability risk, is the audit risk of an online platform for public good crowdfunding.

#### 2.3.1 Internal Control Risk (C6)

Although various risk control mechanisms are set up in the operation process as a non-profit Internet public welfare crowdfunding platform, there are some objective risks in and of themselves. Many platforms enhance their risk control mechanisms using AI intelligence. Because the intelligent AI risk control technology is not a mature technology that is acknowledged as being used, some people continue to use the gaps in it to conduct malicious fundraising, even if this somewhat solves some malicious fundraising behaviors.

#### 2.3.2 Auditor Professional Competence Risk (C7)

The specific processes and handling methods of online public welfare crowdfunding in terms of fund payment, fund management, and fund withdrawal are unfamiliar to auditors in the electronic payment environment, and they also lack the relevant experience in handling Internet public welfare crowdfunding audit risk control. As a result, there is a dearth of relevant professional expertise in recognizing and evaluating the audit risks associated with Internet-based platforms for public welfare crowdfunding.

### 2.4 Platform Security Risk (B4)

Platform security risks include those associated with information leakage, unauthorized fundraising, and fund management on online platforms for public good.

#### 2.4.1 Management Risks of Funds Raised (C8)

It is the platform's duty to hold onto the monies raised

for the fundraiser until the fundraising endeavor is finished. After deducting the platform management charge, the crowdfunding platform will distribute the remaining funds to the project fundraiser if the project is a success. In this process, all capital flow links were implemented and controlled by the crowdfunding platform, which raised the potential risk of fund management, according to Xu et al. (Xu, 2016). This is because there is no relevant department to supervise and escrow the crowdfunding funds.

#### 2.4.2 Illegal Fundraising Risk (C9)

Because Internet public welfare crowdfunding has such strong public welfare qualities, some criminals may use these characteristics to construct some illegal third-party platforms that appear as public welfare crowdfunding platforms with the intent of defrauding a sizable amount of cash raised. Additionally, some tiny platforms will loosen the criteria for help seekers' reviews in order to gain larger platform management fees. Ma (Ma, 2018) thought that illegal fund-raising has severely weakened Internet public welfare crowdfunding and undermined the people's trust in online philanthropy.

#### 2.4.3 Information Leakage Risk (C10)

Platforms on the internet for public good crowdfunding are unbalanced in favor of one over the other. Keeping profits while meeting the demands of all social groups, including donors and those seeking medical care, is extremely difficult for it. Because of this, many platforms will include advertising in order to collect advertising fees, increasing revenue and decreasing losses. Users' personal information may be compromised if the platform's scrutiny of advertising is not stringent enough.

## 3 ANALYTIC HIERARCHY PROCESS

Analytic Hierarchy Process, an international standard analysis technique for complicated decision-making situations, is used in this paper. It was a systematic, hierarchical analytic method that integrates qualitative and quantitative analysis, and it was first officially suggested by the American operations researcher Thomas L. Saaty (Saaty, 1988) in the middle of the 1970s.

### 3.1 Establishment of a Hierarchical Model

According to Dong's research, risk identification was used to construct the hierarchical structure. A

hierarchical structure diagram was ultimately constructed by sorting and categorizing possible risk variables, then placing them among several layers (Dong, 2020). Based on the aforementioned risk analysis, Figure 1 shows the model of risk hierarchy for China's online public welfare crowdfunding.

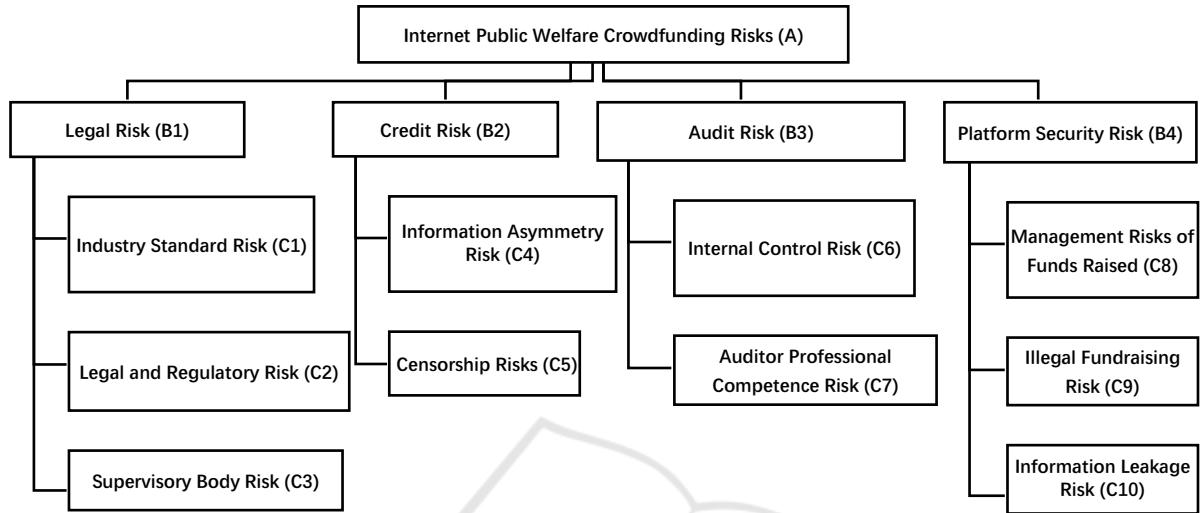


Figure 1: Risk Hierarchy Model of Internet Public Welfare Crowdfunding in China.

### 3.2 Constructing the Pairwise Comparison Matrix

By combining the expert scoring results, a paired comparison matrix may be constructed in accordance with the risk hierarchy model shown in Figure 1. Ten expert scoring sheets in total were gathered. The trustworthiness of scoring was verified by the experts' affiliation with the TOP 10 Internet public welfare crowdfunding platforms and their positions as product operation directors and above. According to Li and Zhang's research, the judgment matrix is built using the 1–9 scale approach, and the weights of the indicators at all levels are then determined (Li, 2006). Tables 1 to 5 display the scoring results and weight results for each judgment matrix.

Table 1: Judgment Matrix A-B.

A	B1	B2	B3	B4	W
B1	1	3	4	2	0.4673
B2	1/3	1	2	1/2	0.1601
B3	1/4	1/2	1	1/3	0.0954
B4	1/2	2	3	1	0.2772
$\lambda_{max}$	CI	RI	CR		
4.031	0.0103	0.89	0.0116		

Table 2: Judgment Matrix B1-C.

B1	C1	C2	C3	W
C1	1	1/6	1/2	0.102
C2	6	1	5	0.7258
C3	2	1/5	1	0.1721
$\lambda_{max}$	CI	RI	CR	
3.0291	0.01455	0.52	0.0279	

Table 3: Judgment Matrix B2-C.

B2	C4	C5	W
C4	1	1/3	0.25
C5	3	1	0.75
$\lambda_{max}$	CI	RI	CR
2	0	0	0

Table 4: Judgment Matrix B3-C.

B3	C6	C7	W
C6	1	3	0.75
C7	1/3	1	0.25
$\lambda_{max}$	CI	RI	CR
2	0	0	0

Table 5: Judgment Matrix B4-C.

B4	C8	C9	C10	W
C8	1	5	4	0.6833
C9	1/5	1	1/2	0.1168
C10	1/4	2	1	0.1998
$\lambda_{max}$	CI	RI	CR	
3.0246	0.0123	0.52	0.0237	

### 3.3 Calculate the Single Sorting Weight Vector and Do the Consistency Test

Enter each judgment matrix into the Matlab program to determine its greatest eigenvalue and eigenvector, then compute the weight vector for each index, and finally run a consistency check on each judgment matrix to guarantee the accuracy of the data. The

consistency test is qualified with the result  $CR \leq 0.1$ . The calculation formulas of CR and CI are as follows, and the value of RI is displayed in Table 6.

$$CR = CI/RI \tag{1}$$

$$CI = \frac{\lambda_{max} - n}{n - 1} \tag{2}$$

CR is the consistency ratio, CI is the consistency index,  $\lambda_{max}$  is the largest eigenroot, n is the order of the matrix, and RI is a random one-time index.

Table 6: Random consistency index RI.

Order (nth)	1	2	3	4	5	6	7	8	9	10	11	12
RI	0	0	0.58	0.89	1.12	1.24	1.32	1.41	1.45	1.49	1.52	1.54

### 3.4 Calculate the Total Sorting Weight Vector and Do a Combined Consistency Test

The weights of the first-level indicators and the second-level indicators must be multiplied one by one in order to determine the total weight. Next, go layer by layer from the bottom to the top to determine the weight of each indication. The results of the hierarchy's overall ranking consistency test are shown in Table 7, and the overall ranking results for each risk factor hierarchy are shown in Table 8. The formula for calculating the total weight consistency ratio  $CR_t$  is as follows.

$$CR_t = \frac{b_1CI_1 + b_2CI_2 + \dots + b_mCI_m}{b_1RI_1 + b_2RI_2 + \dots + b_mRI_m} \tag{3}$$

$CI_m$  is the consistency index of the  $m^{th}$  matrix of the second level, and  $b_m$  is the weight of the index B of the first level.

Table 7: Total Sort Consistency Test.

$CI_i$	0.0146	0	0	0.0123
$RI_i$	0.52	0	0	0.52
$CR_i$	0.0280	0	0	0.0237
CI	0.0102			
RI	0.3871			
CR	0.0263			

Table 8: Overall ranking of risk factors in Internet public welfare crowdfunding.

	B1	B2	B3	B4	Total Weight	Rank
	0.4673	0.1601	0.0954	0.2772		
C1	0.1020				0.0477	7
C2	0.7258				0.3392	1
C3	0.1721				0.0804	4
C4		0.2500			0.0400	8
C5		0.7500			0.1200	3
C6			0.7500		0.0716	5
C7			0.2500		0.0239	10
C8				0.6833	0.1894	2
C9				0.1168	0.0324	9
C10				0.1998	0.0554	6

As can be seen from Table 8, the ranking of Legal and Regulatory Risk (C2) and Supervisory Body Risk (C3) is higher, indicating that Legal Risk (B1) is the most important risk facing China's Internet public welfare crowdfunding. Management Risks of Funds Raised (C8) and Censorship Risks (C5) rank high and are also very important and noteworthy risk factors. The ranking of risk factors can reflect the relative importance of different risk factors; therefore,

corresponding coping strategies can be proposed according to their importance.

## 4 RISK RESPONSE STRATEGIES

The following four risk prevention strategies are proposed for the significance of various risk factors in



light of the results in the aforementioned table. Among them, the first and second points are currently strongly recommended strategies, while the third and fourth points are optional techniques.

(i) Speed up the development of China's Internet public welfare crowdfunding laws and regulations and make clear who will be in charge of them. One idea is to create a law on Internet public welfare crowdfunding by incorporating current laws and regulations including the Public Welfare Donation Law, the Foundation Management Regulations, the Social Organization Registration Management Regulations, and the Charity Law. Both the notion of Internet public welfare crowdfunding and the law's intended application should be explicitly defined in the law's text. At the same time, it should distinctly define the regulations governing the creation of crowdfunding platforms, the verification of platform eligibility, and the project access review procedure. Additionally, the decision made by the supervisory authority is crucial. Since the specific supervisory department for Internet public welfare crowdfunding has not yet been established, the government should do so as soon as possible in order to improve the effectiveness of the department's oversight and the speed with which the law is applied to the sector. Aside from the development of industry associations, the release, fundraising, and implementation of Internet public welfare crowdfunding projects can be effectively supervised to some extent by industry associations as well as government supervision departments. In addition to improving the protection of donors' legal rights and interests, this will significantly advance the healthy growth of public benefit crowdfunding.

(ii) Putting up more restrictions for Internet public welfare crowdfunding platforms and project sponsors. The entrance of crowdfunding platforms and project sponsors should be the first step in the risk prevention of online public welfare crowdfunding. The stability of the industry's future development is determined by the access threshold level. According to Dai (Dai, 2021), platforms for crowdsourcing could be regulated in the form of filing when they were in their early stages of development, while platforms that would more developed could be regulated in the form of approval and are actively watched during their following operations. Moreover, the welfare should provide financial incentives to big Internet businesses so they will enter the industry and contribute to the public good by enabling the adoption of more cutting-edge technologies and the resulting standardization of the industry. Reviewing project sponsors' access requirements is also essential to reducing hazards. The

access assessment of the project sponsors and beneficiaries must be stringent and thorough, and if necessary, they can cooperate with the civil affairs and public security departments to thoroughly examine their identification information, family information, and bank information.

(iii) Give the internal control system your complete attention while enhancing the auditors' technical competence. The audit risk of China's online public welfare crowdfunding platform, in Jiang's opinion (Jiang, 2022), was significantly influenced by the lack of adequate internal controls. Auditors should speak with the grassroots staff of the Internet public welfare crowdfunding platform prior to beginning the audit procedure to gain a thorough understanding of the platform's fundraising process and to check in advance to see if there is any conflict of interest or a relationship between fundraising behavior and employee performance. In addition, auditors should thoroughly examine the internal controls and efficiency of Internet public welfare crowdfunding platforms in order to minimize audit risks and guarantee audit quality. To do this, they should assess the whole internal control system of these platforms. The professional competence of auditors is something else that needs to be enhanced, and their lack of competence is a significant factor contributing to audit risk. The number of qualified auditors should increase, and accounting firms should develop compound auditors with expertise in both traditional auditing and public-welfare crowdfunding.

(iv) Develop network security technologies, make the platform's information more transparent, and set up a third party fund custody system. The first thing the platform needs to do to address the platform security concerns of China's Internet public welfare crowdfunding is to increase the transparency of project information, which includes particular information like financing strategies, amounts, and fund management plans. Giving donors complete transparency and enhancing the platform's legitimacy would help them garner more support, which will help the seekers raise money more swiftly. Furthermore, crowdfunding platforms must establish a third-party fund custody mechanism and segregate their own accounts from fund funds in order to prevent being associated with fund fraud or unlawful fundraising. Its benefit is the realization of the separation of capital flow and information flow, the prevention of the platform's illegal operation, and at the same time the reduction of the platform's management burden and legal risks, allowing the platform to simply assume the roles of an intermediary and carry out its own tasks. In addition, platforms should be encouraged to recruit

and develop cybersecurity technological expertise in response to the risk of information leaking. In order to maintain the smooth operation of the platform and the security of investors' personal information and finances, public welfare crowdfunding platforms should actively study the most recent information in the field of network security, increase investment in money, people, and resources, and outfit a professional network security team.

## 5 CONCLUSION

The risks associated with Internet public welfare crowdfunding in China are divided into four distinct categories and ten specific risk variables in this paper. The following results were reached after using the analytical hierarchy technique to investigate, construct a hierarchical structure model, determine its total risk ranking:

(i) The biggest risk that China's Internet public welfare crowdfunding industry faces is legal risk, therefore the nation needs to improve its proprietary laws and regulations as soon as possible and clarify the monitoring department. (ii) Management risks of funds raised and censorship risk now have a stronger impact on China's Internet public welfare crowdfunding; these risks should be handled by developing a third-party fund trust mechanism and raising the entry threshold for platforms and project initiators. (iii) Despite having a negligible impact, audit risk must be taken into account. Platforms should focus entirely on the internal control system to minimize internal corruption, and accounting firms should raise the professional standards of auditors and improve compound talents that can successfully combine audit knowledge with knowledge of public welfare crowdfunding.

The expert scoring table that was created for this paper's article still has the following flaws: the content is too macroscopic, and the depth of the study is hampered by the lack of content that accurately reflects the impact of specific risks. The suggested risk response method needs to be further investigated and improved due to a lack of field research and real-world experience. In next work and research, these deficiencies must be continuously researched and applied.

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