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Review on China's sports industry financing market based on market -oriented development of sports industry

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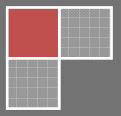
ABSTRACT

Sports industry financing market can't keep long-term stability. It is mainly because there is irrationality in risk assessment of financing project. With the current situation, risks in sports industry financing project should be further studied and build a complete evaluation model to change the condition thoroughly. Firstly, specific process of building a comprehensive fuzzy appraisal model will be introduced in this research. With the subject of construction dimension and construction foundation, construction elements will be discussed in detail. Secondly, the thesis will discuss comprehensive fuzzy appraisal process of "branch risk" probability from the construction of factor sets and weight sets, making risk probability can be accurately calculated. Construction of single factor assessment matrix and comprehensive fuzzy appraisal will be discussed later to calculate risk probability accurately. Finally, three evaluation models including level of evaluation objects from evaluating indexes, comprehensive fuzzy appraisal of "branch risk" damage degree and comprehensive evaluation of "trunk risk" will be studied to keep high accuracy of risk probability calculation. These are main research ideas in this field and show the aim and content of the research.

KEYWORDS

Sports industry; Financial situation; Evaluation model; Risk probability.



INTRODUCTION

There are certain deficiencies in the risk probability of sports industry financing market and the situation in China is also not satisfactory. The research in this field is mainly from several aspects including comprehensive fuzzy evaluation model building of financing projects in sports industry and comprehensive fuzzy evaluation of "branch risk" probability, showing the scientificity and rationality in this field.

FUZZY SYNTHETIC EVALUATION MODEL CONSTRUCTION OF SPORTS INDUSTRY FINANCING PROJECT

Construction foundation

The main foundation of risk evaluation system construction is that some factors like specific results of risk management plan and risk identification are analyzed and considered to make risk and negative effect of investment and financing in sport projects can be evaluated positively. However, in the initial stage of sports industry financing, risks can't be fully reflected. As financing projects go on, risk factor will increase[1]. There are different complexities in different financing projects, so the accuracy of risk evaluation is subjected to data of risk identification.

Construction dimension

Generally, risk identification system construction of investment and financing in sports industry can be divided into four parts. For convenience, in the analysis process of financing risks in sports industry, risks are evaluated though decision tree, flow chart and other special ways. Risks in different level are named as follows. Root risk, also the highest risk, is sports industry financing risk. The second highest risk mainly includes systematic risk and unsystematic risk. The third is branch risk and the last at the bottom is leaf risk. So risk of project investment in sports industry can be shown in the form of risk tree. Relationships among risks are fully shown in Figure 1.

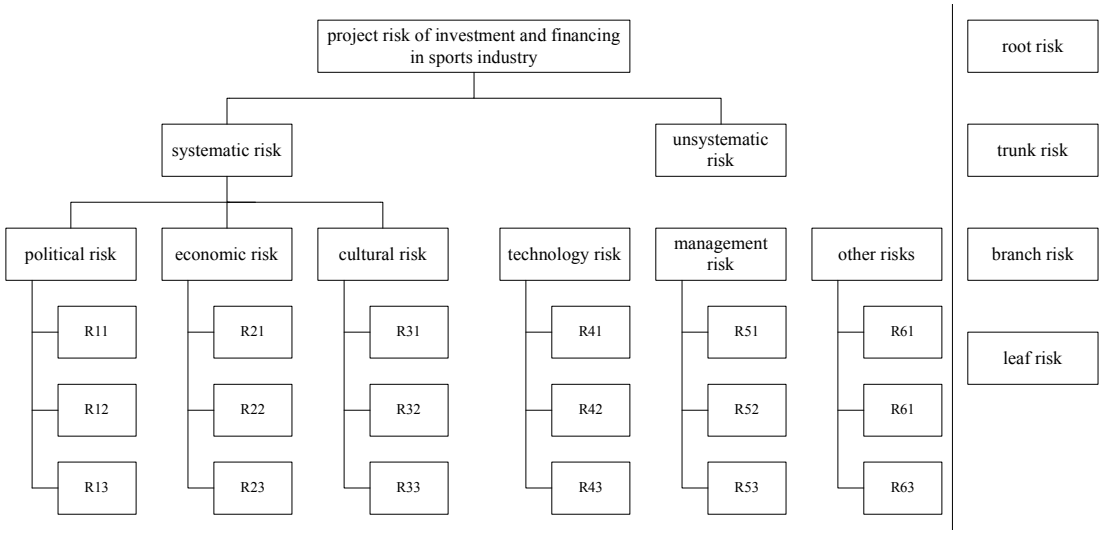


Figure 1 : "Risk tree" model of investment and financing project in sports industry

Two aspects should be considered to evaluate risks from the perspective of the risk's definition. One is the calculation of risk probability, and the other is the specific evaluation of damage brought by risks. However, in the process of sports industry financing, risk of projects need to be evaluated according to the following steps.

In the evaluation of "leaf risk", risk probability should be calculated combined with experts' findings. With the arrangement of findings and calculation structure, risks can be gotten through the fuzzy comprehensive evaluation.

Fuzzy comprehensive evaluation is also applied to evaluate "trunk risk". Elements from branch risk and leaf risk can be combined to calculate risk probability. These factors make combined probability and combined damage effective and clear, providing the basis and guarantee for risk calculation of trunk risk[2].

From the weight of "root risk", the risk of highest layer can be effectively calculated and corresponding result can be gotten. In this way, risk of financing projects in sports industry can be evaluated effectively.

FUZZY COMPREHENSIVE EVALUATION OF "BRANCH RISK" PROBABILITY

In the risk tree model, there are 6 main projects in the branch and leaf layer. To calculate risk frequency in this layer, political risk（R1）needs to be the main evaluation object. And this project can generate positive fuzzy evaluation for other five elements, making the calculation of R1 risk possible. This method also can be used in risk calculation in other branch

and leaf layers. In the risk evaluation of investment and financing in sports industry, special case can be combined to evaluate risk level.

Build the factor set

In this part, financing risks in the risk tree model are listed from three aspects. Firstly, government and relevant departments interfere too much in investment and financing（R11). Secondly, relative legal systems are imperfect（R12）. Thirdly, policy changes frequently. Factor set of political risks（R1）can be defined as X=｛R1，R2，R3｝. From this definition, possible risks can be analyzed effectively by special experience from experts. Qualitative analyses results of fuzzy characteristics can be generated from feasibility analysis of importance.

Build the weight set

In the progress of building weight sets, three factors in political risks R1 need to be determined effectively, including importance degree among $\{R11, R12, R13\}$. Weight coefficients $a_i\,(=1,2,3)$ compose the weight set $A=(a1,a2,a3)$. And $\sum_{i=i}^{i} a_i = 1, a_i > 0, (i=1,2,3)$

In the special risk evaluation of financing projects in sports industry, weight of branch risk should be considered according to the differences of objective conditions, fully reflecting the differences of weight sets. Weight coefficients can be determined by expert investigation method, determining weights of different factors according experts' scoring[3]. However, sometimes, special weight can't be determined because objective factors are complicated, so analytic hierarchy process can be applied to determine weights. Relative weight between factors can be determined in accordance with following methods.

Determine proportion quotient

In the comparison of grade factors, grade proportions can be assigned by 1-9 scale method, as shown in TABLE 1.

TABLE 1 : Meaning of 1-9 scale method

Scale	Meaning
1	Means two elements are equally important when they are compared
3	Means the former element is a little more important than the latter when they are compared
5	Means the former element is obviously more important than the latter when they are compared
7	Means the former element is intensively more important than the latter when they are compared
9	Means the former element is extremely more important than the latter when they are compared
2,4,6,8	Mean the above believe the median of determination
reciprocal	If the importance proportion of element i and element j is W_{ij}, the importance proportion of element j and element i is W_{ij}, $W_{ij}=1/W_{ij}$

Build judgment matrix

Based on evaluation criteria, the weights of five factors are marked and compared to get the judgment matrix of factor weights, as shown in TABLE 2. W represents the nature meeting three conditions, $W_{ij}>0$ $W_{ij}=1/W_{ji}$ $W_{ij}=1$.

TABLE 2 : Judgment matrix of factor weights

R1	R11	R12	R13
R11	1	$a1/a2$	$a1/a3$
R12	$a2/a1$	1	$a2/a1$
R13	$a3/a1$	$a3/a2$	1

Calculate weights of various factors

Firstly, normalize elements in judgment matrix through sequence, getting $W_{1ij}=W_{ij}$.

Secondly, add together the sequences of element s from normalization, getting W_{ij}.

Finally, normalize vector elements uniformly, determining weight set effectively[4].

Check consistency

In the building of judgment matrix, if A is more important than B, B is more important than C, it is obviously wrong that C is more important than A. For this, consistency checking process is needed. The detailed steps are as follows:

Firstly, calculate $\lambda_{\min} = e_1 / 3a_1 + e_2 / 3a_2 + e_3 / 3a_3$, and n=3 in this process.

Secondly, indexes of consistency need to be calculated further, making $CI = (\lambda_{\min} - n) / (n-1)$.

Thirdly, search the mean random consistency indexes RI, and RI is shown in TABLE 3.

TABLE 3 : The table of random consistency indexes

N	1	2	3	4	5	6	7	8	9	10
R1	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.47

Finally, calculate the consistency of relative consistency indexes. Generally, if relative indexes gradually reduce, judgment matrix has corresponding consistency, or the judgment matrix needs to be adjusted.

Build evaluation set

The building of evaluation set is that of risk probability. This process can be divided into two or more levels according real need. It can be divided into five different levels-"very large, large, medium, small, and very small". Evaluation set of political risks are mainly composed of three elements. Here, R1 represents political risks while Y represents evaluation set.

$$Y = \{\text{very large, medium, small}\} = \{y1, y2, y3\}$$

For each element in the set, each probability can belong to the grade level of corresponding evaluation, which forms the fuzzy set, also the single element set for a certain factor. The elements in this set range in the scale of [0,1].

ESTABLISH SINGLE FACTOR EVALUATION MATRIX

To establish single factor evaluation matrix, the first element of risk factors set of political risks should be evaluated by expert investigation method and expert scoring method, asking the experts in or out of the project to score. Weighted average is regarded as the evaluation result[5]. Single factor evaluation of the first element is为 $R_{11} = (r_{11}, r_{12}, r_{13})$, which is a subset of evaluation set Y. And r11 represents the membership degree of $kth(k = 1,2,3,4,5)$ level in evaluation set for the probability of jth factor. The single factor evaluation matrix R is:

$$R = \begin{bmatrix} R_{11} \\ R_{12} \\ R_{13} \end{bmatrix} = \begin{bmatrix} r_{11} r_{12} r_{13} \\ r_{21} r_{22} r_{23} \\ r_{31} r_{32} r_{33} \end{bmatrix}$$

FUZZY COMPREHENSIVE EVALUATION

Fuzzy comprehensive evaluation is applied in the calculation of weight set and the corresponding factor evaluation matrix to get the evaluation set B of political risk. This is the special matrix:

$$AR = (a_1, a_2, a_3) \bullet \begin{bmatrix} r_{11} r_{12} r_{13} \\ r_{21} r_{22} r_{23} \\ r_{31} r_{32} r_{33} \end{bmatrix} = (b_1, b_2, b_3)$$

The calculation of evaluation factors becomes political factor indexes. Speaking of the special meaning, political index factors should be considered. In this situation, b1、b2 and b3 represent the membership degrees of "very large, medium and very small".

DETERMINE THE OBJECT LEVEL ACCORDING TO EVALUATION INDEXES

The level of political risk factors can be measured according to evaluation indexes and there are three ways as follows[6].

Weighted average

This way takes normalized indexes as the factor's weight in corresponding evaluation set and takes a weighted average of evaluation elements. Risk evaluation set which is non - quantifiable should be quantified first, then multiply it by

quantified evaluation indexes. The indexes are set in the range of [0, 1]. For special investment and financing projects, this range can be set according to real situation. The quantization parameters are set as shown in TABLE 4.

TABLE 4 : Quantization parameters of evaluation set of risk probability

Level	Very large	Large	Medium	Small	Very small
Compute sign	P1	P2	P3	P4	P5
Quantized value	0.9	0.7	0.5	0.3	0.1

The above result shows the risk probability with the form of numbers. In the same way, the specific values of other risks according to branch risk can be recorded as p_1, p_2, p_3.

$$P_1 = (b_1, b_2, b_3) \bullet \begin{bmatrix} P_1 \\ P_2 \\ P_3 \end{bmatrix}$$

Maximum membership degree method

The largest evaluation factor is what is expected to be chosen from evaluation factors. The main method is to provide the probability brought by political risk factors and determine the specific location from "very large, large, medium, small, and very small". This method produces only one result which is qualitative.

Fuzzy analytical method

This method can get specific result from risk probability shown by evaluation indexes, which are visual and clear. For evaluation result, indexes should be normalized and $b = b_1 + b_2 + b_3$. The fuzzy and comprehensive evaluation set after normalization is:

$$B^0 = \{b_1 / b, b_2 / b, b_3 / b\} = \{b_1^0, b_2^0, b_3^0\}$$

FUZZY COMPREHENSIVE EVALUATION OF "BRANCH RISK" DAMAGE DEGREE

In the analysis of specific damage degree of risks, the chosen method supposes risk probabilities are equal. When factors X is $\{X1, X2, X3\}$, the corresponding evaluation set Y is $\{Y1, Y2, Y3\}$. If A represents weight set, then A is $\{A1, A2, A3\}$. In this process, specific analysis from relevant experts is needed to determine this set. Experts mark single factor, and multiply the weight indexes by single factor evaluation matrix, getting the comprehensive evaluation set, which is the specific indexes for political risks. Specific processing is according to evaluation indexes through weighted average method. Then the recorded quantitative indexes of evaluation factors need to be reset. In the research of this part, corresponding quantitative relations are shown in TABLE 5.

TABLE 5 : Quantization table of damage degree of political risk R1

Level	Very large	Large	Medium	Small	Very small
Compute sign	C1	C2	C3	C4	C5
Quantized value	9	7	5	3	1

C is supposed to be specific evaluation value of damage brought by political risks, then

$$c_1 = \{b_1^0, b_2^0, b_3^0\} \bullet \begin{bmatrix} c_1 \\ c_3 \\ c_5 \end{bmatrix} = b_1^0 \bullet c_1 + b_2^0 \bullet c_3 + b_3^0 \bullet c_5$$

COMPREHENSIVE EVALUATION OF "TRUNK RISK"

In the above discussion, two factors, risk probability and damage, are analyzed in detail. In the analysis of "trunk risk" of higher level, the relationship of two factors should be considered first[7]. Then the expected value ranges of risk probabilities and damage of six kinds of risks are summarized, as shown in TABLE 6.

TABLE 6 : Evaluation results of "trunk risk"

Trunk risk	Branch and leaf risk	Expected values of probability	Expected values of damage
	Political risk r1		
Systematic risk	Economic risk r2		
	Social and cultural risk r3		
	Technology risk r4		
Unsystematic risk	Management risk r5		
	Other risks r6		

Measuring the probability and damage degree of "trunk risk" is to evaluate the risk level of "trunk risk" on the basis of probability and damage degree of "branch risk", with factors which impacts them considered. Two methods can be applied. One is combined method which considers if various "branch risks" constituting "trunk risk" appear at the same time. Each possible combination is listed and probability and damage degree of "trunk risk" measured by probability theory. The other is fuzzy comprehensive evaluation method. Single factor evaluation matrix can be gotten from the evaluation indexes of "branch risk".

CONCLUSION

That is the studying and research about the financing market in China's sports industry. It focuses on three aspects including comprehensive fuzzy evaluation model building of financing projects in sports industry and comprehensive fuzzy evaluation of "branch risk" probability, showing the scientificity and rationality of model building. This research was also hoped to lay a theoretical foundation for further work.

REFERENCES

[1] Zhang Dengbin; Problems and solutions of financing in China's sports industry, Economic Research Guide, **(18)**, 171-172 **(2013)**.
[2] Li Jiacairang; Financing and Development in Sports Industry, Sport, **(13)**, 134-135 **(2013)**.
[3] Zhou Xueliang; The research on financing channel of china's sports industry marketization, Market Modernization, **(20)**, 353-354 **(2012)**.
[4] Yang Jianrong; The financial environment building of sports industry: Market and participants, Academic Exploration, **(2)**, 91-94 **(2012)**.
[5] Lu Chuan; The research on financing channel and the current situation of China's Sports Industry, Sports Science Research, **15(5)**, 15-18 **(2011)**.
[6] Zhou Jing; Research on problems and countermeasures of the investment and financing system construction for China sports industry journal of China university of petroleum (Edition of Social Science), **(3)**, 31-34 **(2011)**.
[7] Zhu Jianyong; Feasibility analysis of investment and financing in China's sports industry-A case of private capital investment, Journal of Beijing Sport University, **(11)**, 27-30 **(2010)**.