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Research on the Model of CBA League Championship

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Abstract: *Suppose that in this year's CBA league, there are 14 teams in the regular season and playoffs, in which each game must have a victory and defeat, and each team number is fixed. The comprehensive scoring data of each team's on-the-spot performance in each ball game is calculated from the actual participating teams, and each team has about 100 historical scoring data. This article discusses the CBA league title competition based on the comprehensive score data of each team's on-the-spot performance in each ball game. For each team's probability of winning, establish an appropriate mathematical model to analyze and solve.*
First of all, we adopted the analytic hierarchy process to establish the model, and established three levels, namely the target level, the criterion level and the plan level. According to the data provided by the title, we preprocessed the data and simplified the complex data using the normalization method. Then, for each level of specific analysis of the data required, the data is processed vertically and horizontally, and these data are weighted according to different time points to obtain the data we need. Then, to construct a pairwise comparison matrix, we established a pairwise comparison matrix for the criterion layer and the scheme layer, respectively. The pair-wise comparison matrix of the criterion layer artificially determines the proportion of various factors according to the actual CBA game situation. The pair-wise comparison matrix of the plan layer is obtained strictly according to data analysis and is more accurate. Subsequently, the single-rank weight vector and the maximum feature vector are calculated and the consistency test of the hierarchical single-rank is performed. In this process, we refer to the random consistency index RI of American professor T.L. Finally, we calculate the total ranking weight vector and do a consistency test. When the population passes the consistency test, we calculate the ranking vector, estimate the probability of winning each team based on the ranking vector, and predict the top four teams.
Key words: *AHP,MATLAB,Pairwise comparison matrix,Weights.*

I. The Problem Analysis

According to the comprehensive data of each team ’s on-site performance in each game in the table, we comprehensively considered four influencing factors for winning the championship, namely the team ’s stability on the court, the team ’s own level, and foreign aid The strength of the strength and the level of guidance of the coach. According to this, the analytic hierarchy process is used to establish the model to solve.

II. The Model Assumes

To simplify the problem, we make the following assumptions:

1. Assuming that there is a gap in the strength of the participating players, this is an inevitable objective factor.
2. Assuming that there is no anti-counterfeiting behavior, all members will play normally except for force majeure.
3. It is assumed that all members have no accidental injuries during the game.
4. Suppose 1-26 of 100 historical scoring data is the score data of each team in the first year, 27-52 is the score data of each team in the second year, and 53-78 is the score data of each team in the third year Competition score data, 79-100 is the competition score data of each team in the fourth year.

III. Third, Symbol Description

symbol	annotation
F_i	There are i teams in total,i=1,2,3...14
ζ	Weighted standard deviation
λ_{max}	Maximum eigenvalue
u	weighted average

CV	Coefficient of variation
CI	Consistency index
Q	Feature vector
W	Weight vector
RI	Consistency ratio

IV. Fourth, the establishment and solution of the model

1. Solution to the problem

Use AHP to build a model, estimate the probability of each team winning the championship based on the data in the table, and predict the top four teams.

1.1 Establish a hierarchy model

To solve the problem, we take the team's stability on the court, the team's own level, the strength of foreign aid and the coach's guidance level as factors that affect the player's championship, thus obtaining the hierarchical model shown in Figure 1.

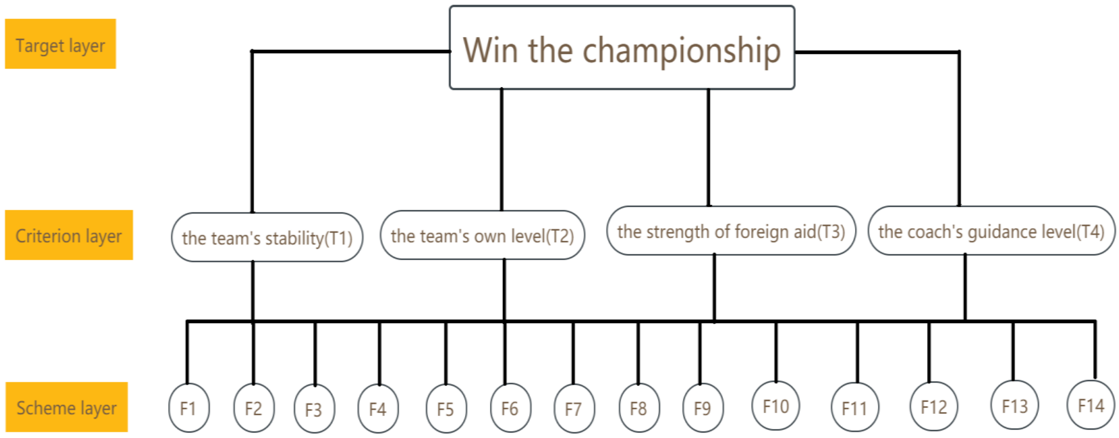

Figure 1

1.2 Construct a pairwise comparison matrix

The pairwise comparison matrix is a comparison of the relative importance of all factors in this layer against a certain factor in the previous layer. The element a_{ij} of the pairwise comparison matrix is given by the 1-9 scale method proposed by Santy.

According to the actual situation, this research needs to analyze whether the actual strength has a big impact on winning the championship or the stability of the team's play has a big impact on winning the championship, or the foreign aid, coaching and other factors have a big impact?

Therefore, we analyze based on the data given, and through analysis and data preprocessing can be obtained: from the vertical point of view, the stability of each team can be obtained by the standard deviation method; from the horizontal point of view, it can be obtained by Take the weighted average of one hundred historical data to get the true strength of each team. However, factors such as foreign aid and coaching cannot be seen from the given data. We have introduced the coefficient of variation as a measure to reflect the level of coaching guidance from this indicator.

The specific method is as follows:

In order to analyze the data more clearly and intuitively, this study uses the min-max standardized normalization method to preprocess the data, which can obtain the processed 100 historical data, which are all in the range of [0,1].

1.2.1 Data analysis and processing

(1)Use excel to find the standard deviation of each ball pair to reflect the degree of dispersion of each team's record (that is, the stability level of each team). However, one hundred data is the level of each game played by each team in four years. Here, the data of each year needs to be weighted. The weighting method is the weighted value of the data of the first year is 10%. The weighted value of the data in the second year is 20%, the weighted value in the third year is 30%, and the weighted value in the fourth year is 40%. The weighted standard deviationζis obtained:

Team A	Team B	Team C	Team D	Team E	Team F	Team G
0.154693	0.203305	0.163182	0.168288	0.218898	0.210932	0.157987
Team H	**Team I**	**Team J**	**Team K**	**Team L**	**Team M**	**Team N**
0.153638	0.170582	0.187072	0.173055	0.198098	0.254871	0.14321

As can be seen:
The stability of team N is super good; the stability of team A, G, H is better; the stability of team C, D, I, J and K is average; the stability of team B, E, F and L is poor; Team M has the worst playing stability. From this data we can draw:
When the weighted standard deviation of each two teams ζ <= 0.01, the scale is 1;
When the weighted standard deviation of each two teams is 0.01> ζ <= 0.02, the scale is 2;
When the weighted standard deviation of each two teams is 0.02> ζ <= 0.03, the scale is 3;
When the weighted standard deviation of each two teams is 0.03> ζ <= 0.04, the scale is 4;
When the weighted standard deviation of each two teams is 0.04> ζ <= 0.05, the scale is 5;
When the weighted standard deviation of each two teams is 0.05> ζ <= 0.06, the scale is 6;
When the weighted standard deviation of each two teams is 0.06> ζ <= 0.07, the scale is 7;
When the weighted standard deviation of each two teams is 0.07> ζ <= 0.08, the scale is 8;
When the weighted standard deviation of each two teams ζ> = 0.08, the scale is 9;
(2) The actual strength of each team is obtained by averaging av. The same hundred data is the level of each game played by each team in four years. Here we need to weight each year 's data The weighting method is 10% for the first year, 20% for the second year, 30% for the third year, and 40% for the fourth year.

Team A	Team B	Team C	Team D	Team E	Team F	Team G
0.360282	0.450146	0.371637	0.469259	0.554897	0.436508	0.317047
Team H	**Team I**	**Team J**	**Team K**	**Team L**	**Team M**	**Team N**
0.497841	0.479479	0.376535	0.465863	0.483847	0.466376	0.428657

As can be seen:
Team M and E's own real strength is super strong; Team B, L and F's own real strength is strong; Team C, D, I, J and K's own real strength is at a medium level; Team A, G, H and N 'S own real strength is weak.
When the weighted average of each two teams u <= 0.02, the scale is 1;
When the weighted average of each two teams is 0.02> u <= 0.04, the scale is 2;
When the weighted average of each two teams is 0.04> u <= 0.06, the scale is 3;
When the weighted average of each two teams is 0.06> u <= 0.08, the scale is 4;
When the weighted average of each two teams is 0.08> u <= 0.10, the scale is 5;
When the weighted average of each two teams is 0.10> u <= 0.12, the scale is 6;
When the weighted average of each two teams is 0.12> u <= 0.14, the scale is 7;
When the weighted average of each two teams is 0.14> u <= 0.16, the scale is 8;
When the weighted average of each two teams u> = 0.16, the scale is 9;
(3) The strength of foreign aid.
According to data analysis, it is found that the influence of foreign aid factors is relatively small, so no detailed study is conducted.
(4) Coaching ability.
In this study, the coach 's guidance ability is not only reflected in the players 'usual training, which has an impact on their own strength, but also whether the players' correct combat plan when played on the court will also affect their game stability. . In this way, in this study, we need to take a comprehensive view of these two factors and introduce the measure of variation coefficient CV.
The formula is:CV=ζ/u

Team A	Team B	Team C	Team D	Team E	Team F	Team G
0.429367	0.451642	0.439089	0.358625	0.394483	0.483226	0.498308
Team H	**Team I**	**Team J**	**Team K**	**Team L**	**Team M**	**Team N**
0.308609	0.355766	0.496824	0.371472	0.409424	0.546492	0.33409

During the statistical analysis of data, the coefficient of variation is obviously greater than 15%. This may be due to the normalization of the data in this study, or there may be reasons for the inaccuracy of the data itself. Here, we use this data to conduct analysis.

When the weighted coefficient of variation of each two teams cv <= 0.02, the scale is 1;

When the weighted coefficient of variation of each two teams is 0.02> cv <= 0.04, the scale is 2;
When the weighted coefficient of variation of each two teams is 0.04> cv <= 0.06, the scale is 3;
When the weighted coefficient of variation of each two teams is 0.06> cv <= 0.08, the scale is 4;
When the weighted coefficient of variation of each two teams is 0.08> cv <= 0.10, the scale is 5;
When the weighted coefficient of variation of each two teams is 0.10> cv <= 0.12, the scale is 6;
When the weighted coefficient of variation of each two teams is 0.12> cv <= 0.14, the scale is 7;
When the weighted coefficient of variation of each two teams is 0.14> cv <= 0.16, the scale is 8;
When the weighted coefficient of variation of each two teams cv> = 0.16, the scale is 9;

1.2.2 Construction of the pairwise comparison matrix of the criterion layer

To compare the criteria T_1 , T_2 , ..., T_i the importance of goal, we must judge by the following formula: $A = (a_{ij})_{n \times n},\ a_{ij} > 0,\ a_{ji} = \frac{1}{a_{ij}}$; $a_{ji} = T_j : T_i$

A: Pairwise comparison of all factors in the criterion layer of the target layer

$$\mathbf{A=}\quad \begin{array}{c} \begin{array}{cccc} T1 & T2 & T3 & T4 \end{array} \\ \begin{pmatrix} 1 & 1/2 & 4 & 3 \\ 2 & 1 & 7 & 5 \\ 1/4 & 1/7 & 1 & 1/2 \\ 1/3 & 1/5 & 2 & 1 \end{pmatrix} \end{array}$$

After a little analysis, it is found that the above pairwise comparison matrix has problems, and the inconsistent situation of the pairwise comparison.

$a_{21} = 2(T_2 : T_1)$; $a_{13} = 4(T_1 : T_3)$; $a_{23} = T_2 : T_3 = 8$

In our pairwise comparison, $a_{23} = 7$, in view of the fact that this situation cannot be avoided, inconsistency is allowed, but the allowable range of inconsistency must be determined.

1.2.3 Calculate the single order weight vector and do consistency check

1) Calculate the single order weight vector

The element of W is the ranking weight of the relative importance of a factor at the same level to the factor at the previous level. This process is called level single ranking.

Let $a_{ij} = T_i / T_j$ Satisfy ($a_{ij} \cdot a_{jk} = a_{ik}$, $i, j, k = 1, 2, \cdots, n$)'s positive reciprocal array A is called a uniform array.

A has a rank of 1, and the only non-zero eigenvalue of A is n $Aw = nw$;

The feature vector corresponding to the non-zero feature root n can be normalized as a weight vector w.

For the inconsistent (but within the allowable range) pairwise comparison matrix A, Saaty et al. Suggested to use the eigenvector corresponding to the largest eigenroot λmax of the A matrix after normalization (to make the sum of the elements in the vector equal to 1) As weight vector w,which is $Aw = \lambda_{\max} w$.

By calculation, the maximum eigenvalue of A $\lambda_{\max} = 4.0215$,

The corresponding feature vector is Q:

Q=(-0.4657,-0.8595,-0.1090,-0.1804)

To use the normalized feature vector Q as the weight vector w:

W=(0.2884,0.5323,0.0675,0.1118)

2) Consistency check of hierarchical order

The so-called consistency test of hierarchical ordering refers to the determination of the inconsistent allowable range for A.

a) Define consistency indicators: $CI = \frac{\lambda_{\max} - n}{n - 1}$

CI = 0, there is complete agreement; CI is close to 0, there is satisfactory agreement; the greater the CI, the more serious the inconsistency.

The only non-zero eigenroot of the uniform matrix of order n is n. The largest characteristic root of the positive reciprocal matrix A of order n is max ≥ n, and A is a uniform matrix if and only if max = n.

Consistency index: $CI = \frac{4.0215 - 4}{4 - 1} = 0.0072$

b) To measure the size of CI, introduce the random consistency index RI. The method is:

$$CI = \frac{\lambda - n}{n - 1}$$

The random consistency index is obtained by repeating the calculation of the characteristic root of the random judgment matrix multiple times (more than 500 times) and taking the arithmetic average.

Saaty's results are as follows:

Stochastic consistency index RI

n	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
RI	**0**	**0**	**0.52**	**0.89**	**1.12**	**1.26**	**1.36**	**1.41**	**1.46**	**1.49**	**1.52**	**1.54**	**1.56**	**1.58**

From the table lookup, the random consistency index RI = 0.9;

Define the consistency ratio: $CR = \frac{CI}{RI}$,

Generally, when the consistency ratio $CR = \frac{CI}{RI} < 0.1$,it is considered that the degree of inconsistency of A is within the allowable range, there is satisfactory consistency, and the consistency test is passed. The normalized feature vector can be used as a weight vector, otherwise, the pair comparison matrix A must be reconstructed and a_{ij} adjusted.

Consistency test: The process of testing A using the consistency index and the consistency ratio <0.1 and the numerical table of random consistency index.

The consistency ratio CR = / 0.9 = 0.0080 <0.1, can pass the consistency test.

Explain that the weights we added still conform to the consistency test, which is more reasonable.

1.3 Establish a pairwise comparison matrix of 14 teams with respect to 4 standards (according to the scale obtained by data processing)

1.3.1 The construction and consistency test of the team's stability pairwise comparison matrix

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
A	1	5	1	2	7	6	1	1	2	4	2	5	9	1/2
B	1/5	1	1/5	1/4	2	1	1/5	1/5	1/4	1/2	1/3	1	6	1/6
C	1	5	1	1	6	5	1	1	1	3	1	4	9	1
D	1/2	4	1	1	5	4	1	1	1	2	1	3	9	1/3
E	1/7	1/2	1/6	1/5	1	1	1/6	1/7	1/5	1/3	1/5	1/2	4	1/8
F	1/6	1	1/5	1/4	1	1	1/6	1/6	1/4	1/3	1/4	1/2	5	1/7
G	1	5	1	1	6	6	1	1	2	3	2	4	9	1/2
H	1	5	1	1	7	6	1	1	2	4	2	5	9	1
I	1/2	4	1	1	5	4	1/2	1/2	1	2	1	3	9	1/3
J	1/4	2	1/3	1/2	3	3	1/3	1/4	1/2	1	1/2	1	7	1/5
K	1/2	3	1	1	5	4	1/2	1/2	1	2	1	3	9	1/3
L	1/5	1	1/4	1/3	2	2	1/4	1/5	1/3	1	1/3	1	6	1/6
M	1/9	1/6	1/9	1/9	1/4	1/5	1/9	1/9	1/9	1/7	1/9	1/6	1	1
N	2	6	2	3	8	7	2	1	3	5	3	6	1	1

Maximum eigenvalue of A $\lambda_{max} = 15.6451$,

The corresponding feature vector is Q:

Q = (-0.3817, -0.0867, -0.3111, -0.2647, -0.0591, -0.0703, -0.3461, -0.3811, -0.2415, -0.1326, -0.2360, -0.1002, -0.0567, -0.5115);

Let the normalized feature vector Q be the weight vector w:

W1=(0.1200,0.0273,0.0978,0.0833,0.0186,0.0221,0.1089,0.1199,0.0760,0.0417,0.0742,0.0315,0.0178,0.1609);

Consistency index $CI = \frac{15.6451 - 14}{14 - 1} = 0.1265$;Random consistency index RI = 1.58 (lookup table).

The consistency ratio CR = 0.1265 / 1.58 = 0.0801 <0.1, passed the consistency test.

1.3.2 Construction and consistency test of the team's own strength pair comparison matrix

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
A	1	1/5	1	1/6	1/9	1/4	3	1/7	1/6	1	1/6	1/7	1/6	1/4
B	5	1	4	1	1/6	1	7	1/3	1/2	4	1	1/2	1	2
C	1	1/4	1	1/5	1/9	1/4	3	1/7	1/6	1	1/5	1/6	1/5	1/3
D	6	1	5	1	1/5	2	8	1/2	1	5	1	1	1	3
E	9	6	9	5	1	6	9	3	4	9	5	4	5	7
F	4	1	4	1/2	1/6	1	6	1/4	1/3	3	1/2	1/3	1/2	1
G	1/3	1/7	1/3	1/8	1/9	1/6	1	1/9	1/9	1/3	1/8	1/9	1/8	1/6
H	7	3	7	2	1/3	4	9	1	1	7	2	1	2	4
I	6	2	6	1	1/4	3	9	1	1	6	1	1	1	3
J	1	1/4	1	1/5	1/9	1/3	3	1/7	1/6	1	1/5	1/6	1/5	1/3
K	6	1	5	1	1/5	2	8	1/2	1	5	1	1	1	2
L	7	2	6	1	1/4	3	9	1	1	6	1	1	1	3
M	6	1	5	1	1/5	2	8	1/2	1	5	1	1	1	2
N	4	1/2	3	1/3	1/7	1	6	1/4	1/3	3	1/2	1/3	1/2	1

Maximum eigenvalue of A $\lambda_{max} = 14.5500$,
The corresponding feature vector is Q:
Q=(-0.0427,-0.1645,-0.0457,-0.2145,-0.7482,-0.1197,-0.0268,-0.3401,-0.2565,-0.0464,-0.2071,-0.2594,-0.2071, -0.1072)
Let the normalized feature vector Q be the weight vector w:
W2=(0.0153,0.0590,0.0164,0.0770,0.2686,0.0430,0.0096,0.1221,0.0921,0.0167,0.0744,0.0931,0.074,0.0385)

Consistency index $CI = \dfrac{14.55-14}{14-1} = 0.0423$;Random consistency index RI = 1.58 (lookup table).

The consistency ratio CR= 0.0423/1.58= 0.0268<0.1, passed the consistency test.
1.3.3 Construction and consistency test of pairwise comparison matrix of team coaching factors

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
A	1	2	1	1/4	1/2	3	4	1/7	1/4	4	1/3	1	6	1/5
B	1/2	1	1	1/5	1/3	2	3	1/8	1/5	3	1/5	1/3	5	1/6
C	1	1	1	1/5	1/3	3	3	1/7	1/5	3	1/4	1/2	6	1/6
D	4	5	5	1	2	7	7	1/3	1	7	1	3	9	1/2
E	2	3	3	1/2	1	5	6	1/5	1/2	6	2	1	1	1/4
F	1/3	1/2	1/3	1/7	1/5	1	1	1/9	1/7	1	1/6	1/4	4	8
G	1/4	1/3	1/3	1/7	1/6	1	1	1/9	1/8	1	1/7	1/5	3	1/9
H	7	8	7	3	5	9	9	1	3	9	4	6	9	2
I	4	5	5	1	2	7	8	1/3	1	8	1	3	9	2
J	1/4	1/3	1/3	1/7	1/6	1	1	1/9	1/8	1	1/7	1/5	3	1/9
K	3	5	4	1	1/2	6	7	1/4	1	7	1	2	9	1/2
L	1	3	2	1/3	1	4	5	1/6	1/3	5	1/2	1	7	1/4
M	1/6	1/5	1/6	1/9	1	1/4	3	1/9	1/9	1/3	1/9	1/7	1	1/9
N	5	6	6	2	4	8	9	1/2	2	9	2	4	9	1

Maximum eigenvalue of A $\lambda_{max} = 15.6831$,

The corresponding feature vector is Q:
Q=(0.1137,0.0794,0.0920,0.3072,0.1887,0.0481,0.0418,0.6424,0.3558,0.0418,0.2599,0.1505,0.0433,0.4529)
Let the normalized feature vector Q be the weight vector w:
W3=(0.0404,0.0282,0.0327,0.1090,0.0670,0.0171,0.0148,0.2280,0.1263,0.0148,0.0922,0.0534,0.0154,0.1607)

Consistency index $CI = \dfrac{15.6831-14}{14-1} = 0.1295$;Random consistency index RI = 1.58 (lookup table).

The consistency ratio CR= 0.1295/1.58= 0.0819<0.1, passed the consistency test.

1.3.4 Foreign aid factors
According to the existing data, it is impossible to accurately know the influence of the strength of foreign aid on the ranking order of the game, and the minimum weight ratio of foreign aid factors in the four influencing factors is 0.0675. According to the current situation, in this study, you can choose Go to this influence factor and influence the team ranking.

1.4 Calculate the total ranking weight vector and make consistency check

(1) Calculate the total ranking weight vector

The total order of the scheme level:

That is, the weight of the i-th factor of the plan layer to the target layer is: $\sum_{j=1}^{m} a_j b_{ij}$

From this, the maximum eigenvalue of each attribute and the corresponding eigenvector can be obtained.

Eigenvalues	the team's stability	the team's own level	the coach's guidance level
λ_{max}	15.6451	14.5500	15.6831

(2) Consistency test of hierarchy total ranking

Suppose layer B, B1, B2, ..Bn, the $A_j (j = 1,2,\cdots,m)$ level single ranking consistency index for the factors in the upper layer A is CI_j, and the random consistency index is RI_j

Then the consistency ratio of the hierarchical total ordering is:

$$CR = \frac{a_1 CI_1 + a_2 CI_2 + \cdots + a_m CI_m}{a_1 RI_1 + a_2 RI_2 + \cdots + a_m RI_m}$$

When CR <0.1, it consistency test, and the total hierarchical ranking has satisfactory consistency. Otherwise, it is necessary to readjust the values of the elements of the judgment matrix with high consistency ratio.
As shown in the chart:

Guidelines		team's stability	own level	the coach's level	Total ranking weight
Criterion weight		A1=−0.4657	A2=−0.8595	A3=−0.1804	
Plan layer single order weigh-ts	F1	B11=−0.3817	B12=−0.0427	B13=0.1137	B1=0.1939
	F2	B21=−0.0867	B22=−0.1645	B23=0.0794	B2=0.1674
	F3	B31=−0.3111	B32=−0.0457	B33=0.0920	B3=0.1676
	F4	B41=−0.2647	B42=−0.2145	B43=0.3072	B4=0.2522
	F5	B51=−0.0591	B52=−0.7482	B53=0.1887	B5=0.6366
	F6	B61=−0.0703	B62=−0.1197	B63=0.0481	B6=0.1690
	F7	B71=−0.3461	B72=−0.0268	B73=0.0418	B7=0.1767
	F8	B81=0.3811	B82=−0.3401	B83=0.6434	B8=0.3539
	F9	B91=−0.2415	B92=−0.2565	B93=0.3558	B9=0.2870
	F10	B101=−0.1326	B102=−00464	B103=0.0418	B10=0.0941
	F11	B111=−0.2360	B112=−0.2071	B113=0.2599	B11=0.2410
	F12	B121=−0.1002	B122=−0.2594	B123=0.1505	B12=0.2425
	F13	B131=−0.0567	B132=−0.2071	B133=0.0433	B13=0.1966
	F14	B141=−0.5115	B142=−0.1072	B143=0.4529	B14=0.2486

From this, the CR values of this model all meet the conditions and meet the consistency test.

1.5 Model solution:

Sorting the comprehensive ranking vector, we can get:

Team E	Team H	Team I	Team D	Team N	Team L	Team K

0.6366	0.3539	0.2687	0.2522	0.2486	0.2425	0.2410
Team M	**Team A**	**Team G**	**Team C**	**Team B**	**Team F**	**Team J**
0.1966	0.1939	0.1767	0.1676	0.1674	0.1269	0.0941

Turn them into probability ratios: P = $w_i \;/\; w_1 + w_2 + \ldots + w_i$;

The following table shows the probability of 15 teams winning the championship, sorted from largest to smallest:

Team	percentage
Team E	18.90872%
Team H	10.51178%
Team I	7.981109%
Team D	7.491015%
Team N	7.384085%
Team L	7.202899%
Team K	7.158345%
Team M	5.839546%
Team A	5.759349%
Team G	5.248463%
Team C	4.978169%
Team B	4.972228%
Team F	3.76927%
Team J	2.795022%

Therefore, according to this model, the top four teams named E, H, I, D are estimated.

V. Conclusion

A team that wants to win the championship in the CBA league must first have strong self-strength. The team without strength can't go to the end no matter what the situation. Secondly, there must be a relatively stable playing state. How does the state of the last game of a team directly affect the next game? If the overall atmosphere and state of the team is not good for half a season, then you want to enter the final or win the championship. Hope is very small. The next step is to have team coordination and coaching guidance. If a team with poor strength has very good team coordination and the coach provides the correct combat policy on the field, it is not impossible to win the championship. In addition to these inevitable factors, there are also accidental factors, such as the arrangement of the games, the number of fouls made by the players, and the referee's decision. These chances are too large, and the luck component is difficult to analyze.

Therefore, the stronger the team's own strength, the more stable the play, the stronger the coaching ability and the more tacit understanding of the teamwork, the more likely this team is to win the championship.

VI. Evaluation of the model

1. Model advantages:

(1) Systematic. Decision-making is based on decomposition, comparison, judgment, and comprehensive thinking to make the entire model more complete and clear.

(2) It is hierarchical. This model is divided into a target layer, a criterion layer and a scheme layer. Both the criterion layer and the scheme layer are weighted and analyzed layer by layer. Compared with the model that only analyzes the criterion layer, this model is more realistic and more convincing. There are irreplaceable advantages of other models.

(3) Practical. The combination of qualitative and quantitative methods has dealt with many practical problems that cannot be solved with traditional optimization techniques. It has a wide range of applications, and decision makers can directly apply it to increase the effectiveness of decision-making.

(4) It has simplicity. The calculation is simple, the result is clear, and it is easy for the decision maker to understand and master.

2. Disadvantages of the model:

Although the analytic hierarchy process is convenient and concise, the comparison, judgment and result calculation process are rough, and the data processing is not accurate enough to make a more accurate judgment. And in the establishment of the hierarchical structure model, for the given comparison matrix, subjective factors have a great influence on the entire process, reducing the persuasiveness of the results.

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