RESEARCH ON CHOOSING A PLACE OF EMPLOYMENT FOR COLLEGE GRADUATES

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ABSTRACT. The problem of how to choose a place of employment as a college graduate concerns all students and their parents. A questionnaire of graduates of our school was designed to accurately understand the current situation of graduate employment, the existing problems and possible future development trends. Based on the investigation data and with the help of Mathematica software, the optimal decision-making scheme is obtained.

Keywords: AHP Method; Choosing Employment Places; Decision Making Scheme

1. Introduction. Choosing employment place is a big problem directly related to students’ future and social stability (Cao, 2008). In order to get more convince and pertinence, a questionnaire is designed for the students to investigate the situation of graduate employment, existing problems and future development trend (Ju, 2002; Lay, 2005; Leon, 2007). After arranging the investigation data collected from those graduates in our school and resorting to Mathematica software, we obtain the optimal scheme by AHP method (Saaty, 1980; Shao, 2000; Wang et al., 2002; Brent et al., 2007) and thus provide the decision-making scheme for the college graduates.


2.1. Establishment of a Hierarchical Model. Taking the employment as the destination layer (A), different aspects of employment as the criteria layer (B), and employment places as the program layer (C), then the hierarchical model is established according to the investigation (See Figure 1).

2.2. Construction of Judgment Matrixes. Starting from the investigation data, the comparative judgment matrix of the criteria layer to the destination layer is

\[
A = \begin{pmatrix}
1 & 2 & 3 & 9 \\
1/2 & 1 & 2 & 5 \\
1/3 & 1/2 & 1 & 2 \\
1/9 & 1/5 & 1/2 & 1 \\
\end{pmatrix}
\] (1)
and the comparative judgment matrixes of the program layer to the criteria layer are

\[ B_1 = \begin{pmatrix} 1 & 1/3 & 7 & 5 \\ 3 & 1 & 9 & 7 \\ 1/7 & 1/9 & 1 & 1/3 \\ 1/5 & 1/7 & 3 & 1 \end{pmatrix}, \quad B_2 = \begin{pmatrix} 1 & 1/3 & 6 & 4 \\ 3 & 1 & 8 & 6 \\ 1/6 & 1/8 & 1 & 1/2 \\ 1/4 & 1/6 & 2 & 1 \end{pmatrix} \]

\[ B_3 = \begin{pmatrix} 1 & 1/2 & 1 & 1/7 \\ 2 & 1 & 2 & 1/5 \\ 1 & 1/2 & 1 & 1/7 \\ 7 & 5 & 7 & 1 \end{pmatrix}, \quad B_4 = \begin{pmatrix} 1 & 1 & 3 & 5 \\ 1 & 1 & 3 & 5 \\ 1/3 & 1/3 & 1 & 2 \\ 1/5 & 1/5 & 1/2 & 1 \end{pmatrix}. \] (2)

2.3. Calculation of Weight Vectors and Consistency Test of Hierarchy Single Ranking. Resorting to Mathematica software and (1), we can compute the largest eigenvalue of matrix A as 4.0193, and the corresponding eigenvector

\[ x = \begin{pmatrix} 0.846531, 0.465437, 0.237663, 0.101341 \end{pmatrix}^T. \] (3)

Through normalization, the eigenvector becomes

\[ w^{(2)} = \begin{pmatrix} 0.512747, 0.281917, 0.143954, 0.0613824 \end{pmatrix}^T. \] (4)

After direct calculation, the consistency index is \( CI = 0.006433 \) and the random consistency index is \( RI = 0.90 \). Thus the consistent rate is obtained by

\[ CR^{(2)} = \frac{CI}{RI} = 0.0071478. \] (5)

Because it is less than 0.1, the consistency is significant.
Similarly, the largest eigenvalues of matrix $B_1, B_2, B_3, B_4$ are

$$
\lambda_1=4.16458, \quad \lambda_2=4.08747, \quad \lambda_3=4.01594, \quad \lambda_4=4.00416
$$

(6)

and the corresponding eigenvectors are

$$
x_1 = (0.440082, 0.886288, 0.064577, 0.129041)^T,
$$

(7)

$$
x_2 = (0.428797, 0.889533, 0.0810641, 0.135251)^T,
$$

(8)

$$
x_3 = (0.124571, 0.228707, 0.124571, 0.957422)^T,
$$

(9)

$$
x_4 = (0.68064, 0.68064, 0.237718, 0.130191)^T.
$$

(10)

Normalizing these vectors, we have

$$
w_1 = (0.28953, 0.583089, 0.0424852, 0.084896)^T,
$$

(11)

$$
w_2 = (0.279411, 0.579634, 0.0528227, 0.0881316)^T,
$$

(12)

$$
w_3 = (0.0867927, 0.159348, 0.0867927, 0.667067)^T,
$$

(13)

$$
w_4 = (0.393618, 0.393618, 0.137474, 0.0752903)^T.
$$

(14)

The consistency indexes are

$$
CI_1 = 0.05486, \quad CI_2 = 0.0291567, \quad CI_3 = 0.0053133, \quad CI_4 = 0.0013867.
$$

(15)

Since each random consistency index is $RI_i = 0.90 \ (i=1,2,3,4)$, the consistent rates are

$$
CR_1 = 0.06096, \quad CR_2 = 0.032397, \quad CR_3 = 0.0059037, \quad CR_4 = 0.0015408.
$$

(16)

Because $CR_i < 0.1, \ (i=1,2,3,4)$, the consistency test is completed.

2.4. Calculation of Weight Vectors and Consistency Test of Hierarchy General Ranking. Through direct calculation, the ranking result of weight vectors is obtained (see Table 1).

Consequently, the weight vector of hierarchy general ranking is

$$
w^{(3)}(k) = W^{(3)}w^{(2)} = (0.428602, 0.424604, 0.179989, 0.352033)^T
$$

(17)

In order to test the consistency of hierarchy general ranking, we calculate the general consistency index $CI^{(3)} = (CI_1, CI_2, CI_3, CI_4)w^{(2)}$ and random consistency index $RI^{(3)} = [RI_1, RI_2, RI_3, RI_4]w^{(2)}$, thus the consistent rate is obtained by

$$
CR^{(3)} = CR^{(2)} + CI^{(3)}/RI^{(3)} = 0.042475.
$$

(18)

<table>
<thead>
<tr>
<th>$k$</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td>$w^{(3)}_k$</td>
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<td>0.0867927</td>
<td>0.393618</td>
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<td>0.579634</td>
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<td>0.667067</td>
<td>0.0752903</td>
</tr>
<tr>
<td>$\lambda_k$</td>
<td>4.16458</td>
<td>4.08747</td>
<td>4.01594</td>
<td>4.00416</td>
</tr>
</tbody>
</table>
Because $CR^{(3)}<0.1$, the significance of the test is obvious and the optimal decision making scheme for college graduates is foreign-owned enterprise.

3. **Conclusions.** There are four different employment choices given to students, i.e., state-owned enterprises, foreign-funded enterprises, private enterprises and self employment. Based on the investigation data, we use AHP method and Mathematica software to make decision on how to choose employment place. Through analysis and calculation, the optimal scheme is obtained.

**Acknowledgment.** This project is supported by the Funds for Basic Research Project under Grant 2008B110003, 2008GJYJ-C42, 2009GJYJ-A19 and 2009GGJS-060.

**REFERENCES**


