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Ranking of Five Star Hotels from the Perspective of Corporate Social Responsibility Dimensions

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Abstract
The present study aims to rank the five-star hotels in Iran from the perspective of cooperate social responsibility (CSR) dimensions. The study is descriptive, and the population includes all of the Iranian five-star hotels, the number of which has been determined to amount to 26. Due to the limited number of hotels as well as the aim of the study, sampling has not been done, and the whole population has come under investigation. For data collection, a questionnaire, designed by the researcher, has been used. To validate the questionnaire, its face validity has been taken into consideration, and the reliability of the questionnaire has been calculated separately for each CSR dimension using Cronbach's alpha coefficient. To analyze the data, the fuzzy TOPSIS method has been used. The results show that Homa Hotel in Bandar Abbas ranks first among the hotels in regard to CSR dimensions.

Keywords: *Corporate Social Responsibility (CSR), The Five Star Hotels, Fuzzy TOPSIS*

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Introduction

Corporate social responsibility has been a topic of interest among academia and business practitioners alike for several decades (Panwar, Han & Hansen, 2010, 122). On the other hand, corporate social responsibility (CSR) is not a new concept, but it appears to be a subject of increasing interest amongst academics and practitioners. It is favored by many as a philosophy and policy which benefits the economy, society and environment based on the idea that companies have wider responsibilities beyond commerce (Henderson, 2007, 228). With a growing concern for corporate social responsibility (CSR), leading companies in various industries, driven by companies' stakeholders, consumers, societies and governments, are accelerating initiatives to demonstrate their CSR commitments (Kang et al, 2010, 72).

CSR as a stakeholder obligation emanated from a repudiation of the notion that business is responsible for society in general, declaring it is answerable only to those who 'directly or indirectly affect or are affected by a firm's activities'. Stakeholder obligation typically extends to:

- Organizations (e.g., employees, customers, shareholders, suppliers);
- Communities (e.g., local residents, special interest groups);
- Regulators (e.g., municipalities, regulatory systems); and
- The media (Barraclough & Morrow, 2008, 1785-1786).

Corporate social responsibility (CSR) can be defined in basic terms as the voluntary commitment of a firm to contribute to social and environmental goals (Lynes & Andrachuk, 2008, 378). Such CSR issues are applied to tourism as a form of sustainability and have been investigated in the literature for the past several decades. In recent years, CSR for tourism-related industries has further gained significance (Inoue & Lee, 2011, 791), and consequently, CSR research into tourism and hotel industries has recently increased (Tsai et al, 2010, 385). Iran's tourism industry, whose development has been a matter of emphasis, especially in the five-year development program, requires serious attention. Meanwhile, the five star-hotels, which are host to many domestic and foreign tourists, should closely pay attention to their social responsibility in order to boost their reputation and could subsequently attract more and more domestic and foreign tourists. In this way, they could not only make more profit but also take a step further towards the economic growth of the society.

In the slipstream of the growing attention for Corporate Social Responsibility (CSR), the measurement of the CSR performance of companies has become a booming business. Governments, nongovernmental organizations, academics and companies themselves have taken interest in quantitative indicators that measure companies' corporate governance and environmental, social and economic performance (Van den Bossche et al, 2010, 1159).

Measuring CSR is a complicated issue. On the one hand, this complexity is due to the number of variables involved in the issue, and on the other hand, it is due to the existence of verbal variables which add the index of ambiguity to the decision-making process.

Faced with verbal variables, the conventional decision-making models use the binary logic, although such decisions are of a continuous nature (degree and the amount of belonging).

To deal with such situations, suitable decision-making tools are needed. It seems that, in these cases, fuzzy mathematics will be the perfect tool for modeling. In cases that we have to convert the verbal variables to mathematic models, due to the nature of knowledge, which are explained with verbal variables, utilizing the fuzzy theory and logic will be suitable. In this regard and considering the above-mentioned discussions, the present research attempts to rank the five star hotels of Iran from the prospective of CSR dimensions with using the fuzzy TOPSIS method.

Corporate Social Responsibility

The theme of Corporate Social Responsibility (CSR) has a long history (Ciliberti, Pontrandolfo & Scozzi, 2008, 88). Academics' consideration of the notion of corporate social responsibility has been around since the 1950s, proliferating in the 1970s (Carroll, 1999) and gaining increasing currency in the 1990s and the new millennium (De Bakker et al, 2005). Within the scientific literature, the term CSR was first formalized by Bowen in 1953(Falck &Heblich, 2007, 248). Bowen claimed that companies have the obligation to ''pursue those policies, to make those decisions, or to follow those lines of action that are desirable in terms of the objectives and values of our society'' (Ciliberti, Pontrandolfo & Scozzi, 2008, 88).

Bowen (1953) argued in a normative way that "it refers to the obligations of businessmen to pursue those politics, to make those decisions, or to follow those lines of actions which are desirable in terms of the objectives and values of society". A decade later, several authors, including Davis (1960), Fredrick (1960), McGuire (1963), and Walton (1967), undertook further development of the concept. Notably, these authors, like Bowen before them, referred only to 'businessmen'. Davis (1967) finally enlarged the definition of CSR to include institutions and, thus, enterprises. This was a crucial development, as up to that point, the use of the term 'businessmen' had implied that an enterprise's owner was also its manager, thus bearing the cost of every social commitment personally. However, since CSR was expanded to include enterprises in their own right as legal entities, the attribution of costs has not been easy. In the case of a manager-led enterprise, for example, the legal representatives of the enterprise, the managers, do not bear the costs of social conduct; but rather, they decide to take these actions in their role as agents of the principals. This caused Nobel Prize winner Milton Friedman (1962, 1970) to fundamentally reject corporate social commitment (Falck & Heblich, 2007, 248-249). Definitions of social responsibility typically link the construct of social responsibility to increased ethical behavior. For example, Watts and Holme (1999) define social responsibility as follows: ''Corporate social responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large" (Watts & Holme, 1999). Several definitions of CSR can be found in the literature (Golob & Bartlett, 2007, 2).

Holmqvist's (2009) definition of CSR as the organization's status and activities with respect to its perceived societal obligations provides a useful starting point. The definition has also been adopted in the subsequent research on CSR in marketing (Holmqvist, 2009). According to the stakeholder theory (Lee & Heo, 2009), CSR activities may enhance brand image, not only for customers, but also for employees and other stakeholders. Therefore, such activities can subsequently enhance customers 'satisfaction, employees' morale and retention rates, and relationships with governments.

Numerous studies have examined motivations for environmental responsibility (Lynes & Andrachuk, 2008) as well as motivations for social responsibility, and there has been a growing trend towards looking at corporate social and environmental responsibility (CSER) in union. Corporate Social Responsibility (CSR) can be defined as "the voluntary integration, by companies, of social and environmental concerns in their commercial operations and in their relationships with interested parties'' (Ciliberti et al, 2008). Likewise, reporting on environmental and social matters has been prevalent for several decades with further growth over the past decade or so.

According to Caroll, for CSR to be accepted by a conscientious business person, it should be framed in such a way that the entire range of business responsibilities is embraced. It is suggested here that four kinds of social responsibilities constitute total CSR: economic, legal, ethical, and philanthropic. Furthermore, these four categories or components of CSR might be depicted as a pyramid. To be sure, all of these kinds of responsibilities have always existed to some extent, but it has only been in recent years that ethical and philanthropic functions have taken a significant place. Each of these four categories deserves closer consideration (Caroll, 1991, 40). The pyramid of corporate social responsibility is depicted in Figure 1.

Figure 1 portrays the four components of CSR, beginning with the basic building block notion that economic performance undergirds all else. At the same time, business is expected to obey the law because the law is society's codification of acceptable and unacceptable behavior. Next is business's responsibility to be ethical. At its most fundamental level, this is the obligation to do what is right, just, and fair, and to avoid or minimize harm to stakeholders (employees, consumers, the environment, and others). Finally, business is expected to be a good corporate citizen. This is captured in the philanthropic responsibility, wherein business is expected to contribute financial and human resources to the community and to improve the quality of life (Ibid, 42).

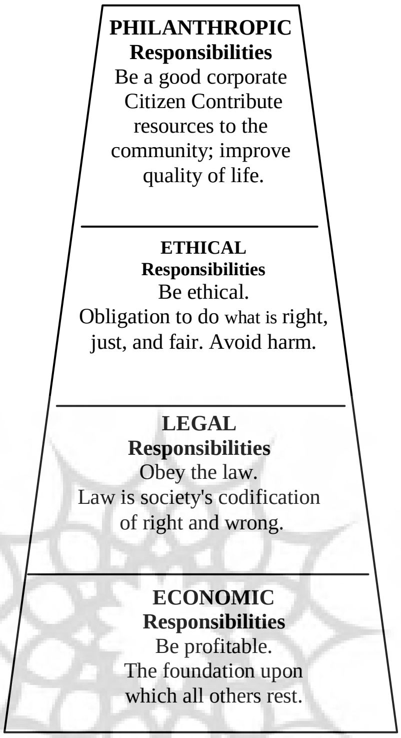

Figure-The Pyramid of Corporate Social Responsibility

According to Velde et al. (2005) corporate social responsibility can be measured on five dimensions.

Velde et al. used the Vigeo corporate social responsibility scores. Vigeo is an independent corporate social responsibility agency that screens European quoted companies on CSR.

The scores of Vigeo contain information on five dimensions of corporate social responsibility:

1. Human resources.
2. Environment.
3. Customers and suppliers.
4. Community and society.
5. Corporate governance (Velde et al, 2005, 131).

Inoue & Lee (2011) used the KLD STATS database, which evaluates firms based on their degrees of corporate attention to several stakeholder issues, such as employee relations, product quality, the natural environment, diversity, community relations, corporate governance, human rights, and other controversial business issues. Among these categories, this study have focused on the five categories that represent the level of corporate voluntary activities for primary stakeholders and that have been frequently used by the previous empirical research. These categories include employee relations (Employee), product quality (Product), environmental issues (Environment), diversity issues (Diversity), and community relations (Community).

Van den Bossche et al (2010), to assess the CSR performance of companies, used the EIRiS1 database.

The dimensions of cooperate social responsibility in this research are:

1. Economic policy
2. Corporate governance and business ethics
3. Environment
4. Internal social policy
5. Human rights
6. Involvement in questionable technologies/practices.

Despite the diversity of viewpoints, the benefits of CSR activities have been mentioned in different studies. Five main areas of CSR business benefits can be identified from this research (Weber, 2008, 248-247):

1. Positive effects on company image and reputation: Image represents ''the mental picture of the company held by its audiences'', which is influenced by communication messages. Reputation builds upon personal experiences and characteristics and includes a value judgment by a company's stakeholders. Whereas image can change quickly, reputation evolves over time and is influenced by consistent performance and communication over several years. Both image and reputation can influence company competitiveness. Schwaiger (2004) found in his empirical research that CSR could influence reputation. The Harris-Fombrun Reputation Quotient equally includes CSR as one dimension influencing company reputation.

2. Positive effects on employee motivation, retention, and recruitment: On the one hand, effects in this area can result from an improved reputation. On the other hand, CSR can also directly influence

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[1]- Ethical Investment Research Services, www.eiris.org

employees as they might be more motivated to work in a better working environment or become motivated by participation in CSR activities such as volunteering programs. Similarly, CSR activities can directly or indirectly affect the attractiveness of a company for potential employees.

3. Cost savings: Cost savings have been extensively discussed in sustainability research. For example, Epstein and Roy (2001) argued that efficiency gains could result from a substitution of materials during the implementation of a sustainability strategy, improved contacts to certain stakeholders such as regulators resulting in time savings, or improved access to capital due to a higher sensitivity of investors to sustainability issues.

4. Revenue increases from higher sales and market share: Often, researchers argue that CSR can lead to revenue increases. These can be achieved indirectly through an improved brand image or directly by, for example, a CSR-driven product or market development.

5. CSR-related risk reduction or management: CSR can also be used as a means to reduce or manage CSR-related risks such as the avoidance of negative press or customer/ NGO boycotts. These five clusters of CSR business benefits are similar to the systematization of value drivers of sustainability. Theoretically identified five main effects of tackling environmental and social issues: direct financial effects (e.g., fines, charitable contributions), market effects (e.g., customer retention), effects on business and production processes (e.g., lower production costs), effects on learning and organizational development (e.g., employee motivation, innovation), and non-market effects (e.g., less stakeholder resistance towards production facilities). Using a case study methodology, Thorpe and Prakash-Mani (2003) discussed six business success factors of sustainability, which are reflected in the above effects: revenue growth and market access, cost savings and productivity, access to capital, risk management and license to operate, human capital, brand value and reputation. Based upon a cross-industry quantitative empirical investigation, Steger (2006) identified similar value drivers including cost decreases, revenue increases, brand value and reputation, maintaining the license to operate, and employee attraction and satisfaction.

Fuzzy Topsis

TOPSIS views a MADM problem with m alternatives as a geometric system with m points in the n-dimensional space (Sun & lin, 2009, 11766). Hwang & Yoon (1981) first developed the TOPSIS. According to this technique, the best alternative would be the one that is nearest to the positive-ideal solution and farthest from the negative ideal solution (Dag˘deviren, Yavuz & Kılınc, 2009, 8145). TOPSIS defines an index called similarity to the positive-ideal solution and the remoteness from the negative-ideal solution. Then the method chooses an alternative with the maximum similarity to the positive-ideal solution (Wang & Chang, 2007, Sun, 2010, 3).

TOPSIS method is a popular approach to multiple criteria decision making (MCDM) and has been widely used in the literature (Wang & Elhag, 2006). There are numerous studies that have applied TOPSIS method to solve different problems (Abo-Sinna & Amer, 2005; Chen & Tzeng, 2004; Gumus, 2009). In traditional TOPSIS, the weights of the criteria and the ratings of alternatives are known precisely and are treated as crisp numerical data (Kelemenis, Askounis, 2010).

It is often difficult for a decision-maker to assign a precise performance rating to an alternative for the attributes under consideration. The merit of using a fuzzy approach is to assign the relative importance of attributes using fuzzy numbers instead of precise numbers. (Yang & Hung, 2007; Sun & lin, 2009; Torfi, Farahani & Rezapour, 2010). Indeed, human judgments including preferences are vague or fuzzy in nature and as such it may not be appropriate to represent them by accurate numerical values.

A more realistic approach could be to use linguistic variables to model human judgments; that is, to suppose that the ratings and weights of the attributes in the decision making problem are assessed by means of linguistic variables (Li, 2007, 807). Fuzzy TOPSIS has been widely used in the literature(Dag˘deviren, Yavuz & Kılınc, 2009; Kuo, Tzeng & Huang, 2007; Yurdakul & Tansel Ic, 2009; Kannan, Pokharel & Kumar, 2009; Wang, Fan & Wang, 2010; Chamodrakas, Alexopoulou & Martakos, 2009; Wang, Cheng & Kun-Cheng, 2009; Wang & Elhag, 2006; Amiri, 2010; Wang & Lee, 2007; Wang & Chang, 2007; Kelemenis & Askounis, 2010; Sun & Lin, 2009). In the following, some basic important definitions of fuzzy sets are given (Raj & Kumar, 1999).

Definition1. A fuzzy set $\tilde{A}$ in a universe of discourse X is characterized by a membership function $\mu_{\tilde{A}}(x)$ which associates with each element x in X a real number in the interval [0, 1]. The function value $\mu_{\tilde{A}}(x)$ is termed the grade of membership of x in $\tilde{A}$.

Definition2. A triangular fuzzy number $\tilde{A}$ can be defined by a triplet (a,b,c) shown in Fig.2. The membership function $\mu_{\tilde{A}}(x)$ is defined.

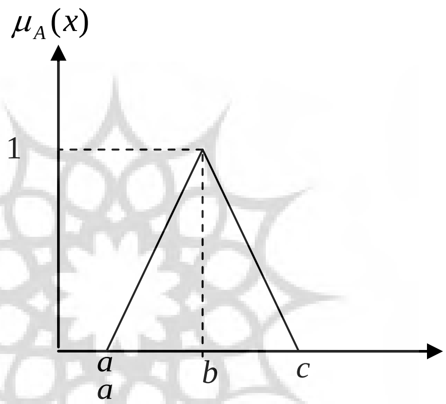

Figure2- Membership Function of Triangular Fuzzy Number $\tilde{A}$

$$\begin{cases} \dfrac{x-a}{b-a} & a < x < b \\ 1 & x = b \\ \dfrac{c-x}{c-b} & b < x < c \\ 0 & others \end{cases} \qquad (1)$$

Definition3. Let $\tilde{A}$ and $\tilde{B}$ two triangular fuzzy numbers parameterized by the triplet (a_1, b_1, c_1) and (a_2, b_2, c_2) respectively, then the operational laws of these two triangular fuzzy numbers are as follows:

$$\tilde{A}(+)\tilde{B} = (a_1, b_1, c_1)\ (+)\ (a_2, b_2, c_2) = (a_1 + a_2, b_1 + b_2, c_1 + c_2) \qquad (2)$$

$$\tilde{A}(-)\tilde{B} = (a_1, b_1, c_1)\ (-)\ (a_2, b_2, c_2) = (a_1 - a_2, b_1 - b_2, c_1 - c_2) \qquad (3)$$

$$\tilde{A}(\times)\tilde{B} = (a_1, b_1, c_1)\ (\times)\ (a_2, b_2, c_2) = (a_1.a_2, b_1.b_2, c_1.c_2) \qquad (4)$$

$$\tilde{A}(\div)\tilde{B} = (a_1, b_1, c_1)\ (\div)\ (a_2, b_2, c_2) = \left(\frac{a_1}{a_2}, \frac{b_1}{b_2}, \frac{c_1}{c_2}\right) \qquad (5)$$

$$K\tilde{A} = (Ka_1, Ka_2, Ka_3) \qquad (6)$$

Definition4. Let $\tilde{A}$ and $\tilde{B}$ two triangular fuzzy numbers parameterized by the triplet (a_1, b_1, c_1) and (a_2, b_2, c_2) respectively, and then the vertex method is defined to calculate the distance between them.

$$d(\tilde{A}, \tilde{B}) = \sqrt{\frac{1}{3}\left[(a_1 - a_2)^2 + (b_1 - b_2)^2 + (c_1 - c_2)^2\right]} \qquad (7)$$

According to the briefly summarized fuzzy theory above, the algorithms of fuzzy TOPSIS method are described as follows:

Step1) Determine the weighting of evaluation criteria: Chen and Tzeng (2004) noted that the weights of criteria in decision-making problems have different meanings, and not all of them can be assigned equal importance. To resolve this issue, several methods can be utilized to determine the weights, including analytic hierarchy process (or fuzzy AHP), entropy analysis, eigenvector method, weighted least square method and linear programming for multi-dimensions of analysis preference (LINMAP). The importance weights of criteria in the real world are always subjective, reflecting the preference of decision makers (Wang and Chang, 2007, 873).

In this study, we have opted for Wang and Chang's (1995) method to determine the weighting of evaluation criteria. This study provided evaluators with five linguistic variables (Wang & Chang, 1995; Chen, 2000; Wang and Chang, 2007), namely ''very low'', ''low'', ''medium'', ''high'' and ''very high'', which were expressed in triangular fuzzy numbers to assess the importance weights of performance criteria. To integrate the different opinions of evaluators, this study adopted the synthetic value notation to aggregate the subjective judgment for k evaluators, given by Eq. (2). The linguistic scales and corresponding triangular fuzzy numbers are shown in Table 1.

Table: Linguistic Scales for the Importance Weight of Each Criterion

Linguistic variable	Corresponding triangular fuzzy number
Very low (VL)	(0, 0.1, 0.3)
Low (L)	(0.1, 0.3, 0.5)
Medium (M)	(0.3, 0.5, 0.7)
High (H)	(0.5, 0.7, 0.9)
Very high (VH)	(0.7, 0.9, 1)

Step2) Construct the fuzzy decision matrix and choose the appropriate linguistic variables for the alternatives with respect to the criteria: Atypical fuzzy multi-criteria group decision-making problem can be expressed in matrix format as:

$$\tilde{D} = \begin{array}{c} \\ A_1 \\ A_2 \\ \vdots \\ A_m \end{array} \begin{array}{c} \begin{array}{cccc} C_1 & C_2 & \cdots & C_n \end{array} \\ \begin{bmatrix} \tilde{x}_{11} & \tilde{x}_{12} & \cdots & \tilde{x}_{1n} \\ \tilde{x}_{21} & \tilde{x}_{22} & \cdots & \tilde{x}_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \tilde{x}_{m1} & \tilde{x}_{m2} & \cdots & \tilde{x}_{mn} \end{bmatrix} \end{array}, i = 1,2,\ldots,m,\ j = 1,2,\ldots,n \quad (8)$$

For each evaluator with the same importance, this study employs the method of average value to integrate the fuzzy judgment values of different evaluators regarding the same evaluation dimensions. The fuzzy performance score $\tilde{x}_{ij}$ for k evaluators concerning the same evaluation criteria is calculated through Equation (9):

$$\tilde{x}_{ij} = \frac{1}{k}\left(\tilde{x}_{ij}^{1} + \tilde{x}_{ij}^{2} + \ldots + \tilde{x}_{ij}^{k}\right) \quad (9)$$

The evaluators then adopted linguistic terms (see Table 2 and Fig 3),

Tabla2- Linguistic Scales for the Rating of Each Hotels

Linguistic variable	Corresponding triangular fuzzy number
Very low (VL)	(0, 0, 0.25)
Low (L)	(0, 0.25, 0.5)
Medium (M)	(0.25, 0.5, 0.75)
High (H)	(0.5, 0.75, 1)
Very high (VH)	(0.75, 1, 1)

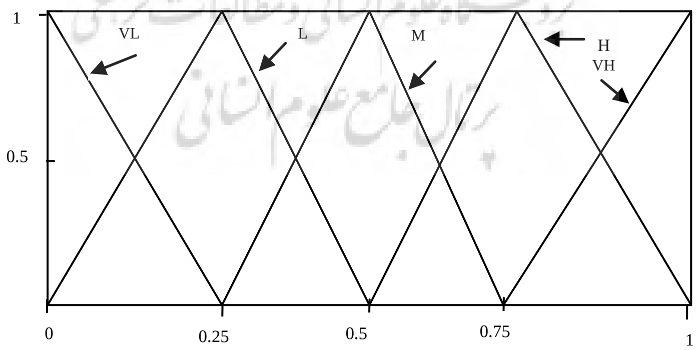

Figure3-Membership Functions of Linguistic Values for the Rating of Each Hotel

Step3) Normalize the fuzzy decision matrix: The normalized fuzzy decision matrix denoted by $\tilde{R}$ is shown as the following formula:

$$\tilde{R} = \left[\tilde{r}_{ij}\right]_{m\times n}, \qquad i = ۱,۲,...,m; \quad j = ۱,۲,...,n \qquad (10)$$

Where

$$\tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^+}, \frac{b_{ij}}{c_j^+}, \frac{c_{ij}}{c_j^+}\right), c_j^+ = \max c_{ij} \qquad (11)$$

Step4) Construct weighted normalized fuzzy decision matrix: Considering the different weight of each criterion, the weighted normalized decision matrix can be computed by multiplying the importance weights of evaluation criteria by the values in the normalized fuzzy decision matrix. The weighted normalized decision matrix $\tilde{v}$ is defined as:

$$\tilde{R} = \left[\tilde{V}_{ij}\right]_{m\times n}, \qquad i = ۱,۲,...,m; \quad j = ۱,۲,...,n \qquad (12)$$

$$\tilde{v}_{ij} = \tilde{r}_{ij} \otimes \tilde{w}_j \qquad (13)$$

Where $\tilde{w}_j$ represents the importance weight of criterion c_j .

Step 5) Determine the fuzzy positive-ideal solution (FPIS) and fuzzy negative-ideal solution (FNIS): According to the weighted normalized fuzzy decision matrix, we know that the elements $\tilde{v}_{ij}$ are normalized positive TFNs and their ranges belong to the closed interval [0, 1]. Then, we can define the FPIS A^+ and FNIS A^- as following formula:

$$A^+ = \left(\tilde{v}_1^+, \tilde{v}_2^+, \ldots, \tilde{v}_n^+\right) \qquad (14)$$

$$A^- = \left(\tilde{v}_1^-, \tilde{v}_2^-, \ldots, \tilde{v}_n^-\right) \qquad (15)$$

Where $\tilde{v}_j^+ = (1,1,1)$ and $\tilde{v}_j^+ = (0,0,0), j = 1,2,...,n$

Step 6) Calculate the distance of each alternative from FPIS and FNIS: The distances (d_i^+ and d_i^-) of each alternative A^+ from and A^- can be currently calculated by the area compensation method.

$$d_i^+ = \sum_{j=1}^{n} d\left(\tilde{v}_{ij}, \tilde{v}_j^+\right), i = 1,2,\ldots,m \quad j = 1,2,\ldots,n \qquad (17)$$

$$d_i^- = \sum_{j=1}^{n} d\left(\tilde{v}_{ij}, \tilde{v}_j^-\right), i = 1,2,\ldots,m \quad j = 1,2,\ldots,n \qquad (18)$$

Step 7) Obtain the closeness coefficient and rank the order of alternatives: The CC_i is defined to determine the ranking order of all alternatives once the d_i^+ and d_i^- of each alternative have been calculated. Calculate similarities to ideal solution. This step solves the similarities to an ideal solution by the following formula:

$$cc_i = \frac{d_i -}{d_i^+ + d_i^-}, \qquad i = ۱,۲,...,m \qquad (19)$$

According to the CC_i , we can determine the ranking order of all alternatives and select the best one from among a set of feasible alternatives.

Materials and Methods

Regarding the research purpose, this study is an applied one, and regarding research methodology, it is a descriptive study. The research population includes all the five star hotels in Iran, which are rated as alternatives within the fuzzy model. The number of these hotels, according to the statistics issued by the country's tourism organization, is 26.Due to the limited number of hotels as well as limitations in data analysis procedure, no sampling has been done.

For data collection, a questionnaire, based on CSR dimensions from the standpoint of Velde et al (2005), has been used. The reason for choosing the CSR from Veild et al.'s standpoint is that it is more compatible with the performance of hotels and better capable of collating information from the population

To validate the questionnaire, its face validity has been taken into consideration, and the reliability of the questionnaire has been calculated separately for each CSR dimension using Cronbach's alpha coefficient. The amounts of Cronbach's alpha coefficient calculated for the different indexes are: 0.812 for workplace conditions, 0.869 for the ecological system, 0,903 for business behavior, 0.798 for society and local community, and 0.834 for company leadership. Considering the amounts of Cronbach's alpha coefficient calculated for CSR dimensions, all of which are more than 0.7, it can be concluded that the prepared questionnaire is of acceptable reliability.

Data Analysis and Results

Data analysis procedure is presented as follows:

Step 1) Determining the weights of indexes: In this study, based on Velde et al's (2005) views on CSR, the indexes of Environment (C1), Human resources (C2), Customers and suppliers (C3), Community and society (C4) and the Corporate governance (C5) were determined as the indexes of CSR to rate the hotels.

In order to determine the weights of the indexes, ten experts including five management masters, three economic masters and two social sciences masters, who had teaching and working experience in the issues involved in CSR, have been asked to determine the weight of each of the indexes.

The results of each experts' judgment about the weights of indexes and also the average of their opinions, calculated by using the formula (9) and the relevant fuzzy numbers in Table 1, has been demonstrated in Table 3.

Table 3- Determining the Weights of Indexes

Index					Experts
C5	C4	C3	C2	C1	
much	very much	very much	very much	much	Expert 1
much	very much	very much	very much	very much	Expert 2
average	very much	much	much	very much	Expert 3
average	very much	much	much	much	Expert 4
less	very much	much	very much	much	Expert 5
average	much	much	very much	much	Expert 6
much	very much	much	very much	much	Expert 7
average	much	much	very much	average	Expert 8
much	very much	very much	much	much	Expert 9
much	very much	very much	much	very much	Expert 10
0.380, 0.580, (0.780)	0.600, 0.860, (0.980)	0.580, 0.780, (0.940)	0.620, 0.820, (0.960)	0.540, (0.740 ,0.910)	Fuzzy Mean
0.580	0.833	0.767	0.800	0.730	Crisp

Step2) Construct the fuzzy decision matrix and choose the appropriate linguistic variables for the alternatives with respect to the criteria: Based on the analysis of the data obtained from the questionnaire and the fuzzy amount of each index for the five star hotels by using the formula (9), the resultant fuzzy amount for CSR

indexes was fed into the model (separately for each hotel). The fuzzy decision-making matrix has been presented in table (4). It is noteworthy that in order to determine the fuzzy size of each index for each five star hotel, the verbal variables and fuzzy numbers relevant to the table (2) and Fig (3) have been used.

Table 4- Fuzzy Decision Making Matrix

	C1	C2	C3	C4	C5
A1	(0.650, 0.900, 1.000)	(0.584, 0.834, 0.958)	(0.750, 1.000, 1.000)	(0.428, 0.786, 0.928)	(0.750, 1.000, 1.000)
A2	(0.550, 0.800, 0.900)	(0.583, 0.832, 0.958)	(0.541, 0.791, 0.958)	(0.500, 0.750, 0.950)	(0.600 0.916 1.000)
A3	(0.650, 0.900, 1.000)	(0.583, 0.832, 0.958)	(0.666, 0.916, 0.958)	(0.650, 0.850, 0.950)	(0.750, 1.000, 1.000)
A4	(0.650, 0.900, 1.000)	(0.625, 0.875, 1.000)	(0.500, 0.750, 0.916)	(0.400, 0.650, 0.900)	(0.150, 0.750, 1.000)
A5	(0.500, 0.700, 0.850)	(0.541, 0.791, 0.958)	(0.625, 0.875, 1.000)	(0.650, 0.900, 1.000)	(0.500, 0.750, 0.833)
A6	(0.500, 0.750, 0.950)	(0.125, 0.330, 0.583)	(0.375, 0.625, 0.875)	(0.500, 0.750, 0.900)	(0.500, 0.750, 1.000)
A7	(0.400, 0.600, 0.800)	(0.458, 0.708, 0.958)	(0.625, 0.875, 1.000)	(0.438, 0.678, 0.857)	(0.583, 0.833, 1.000)
A8	(0.250, 0.500, 0.700)	(0.625, 0.875, 1.000)	(0.478, 0.708, 0.916)	(0.600, 0.850, 1.000)	(0.000, 0.083, 0.333)
A9	(0.700, 0.950, 1.000)	(0.531, 0.781, 0.938)	(0.563, 0.813, 1.000)	(0.333, 0.583, 0.833)	(0.417, 0.667, 0.917)
A10	(0.450, 0.700, 0.900)	(0.625, 0.875, 1.000)	(0.583, 0.832, 0.950)	(0.450, 0.700, 0.900)	(0.083, 0.333, 0.583)
A11	(0.550, 0.800, 0.900)	(0.458, 0.708, 0.916)	(0.125, 0.333, 0.583)	(0.600, 0.850, 1.000)	(0.166, 0.416, 0.666)
A12	(0.550, 0.800, 1.000)	(0.541, 0 .791, 1.000)	(0.583, 0.833, 1.000)	(0.400, 0.650, 0.850)	(0.750, 1.000, 1.000)
A13	(0.600, 0.850, 1.000)	(0.666, 0.916, 1.000)	(0.625, 0.875, 1.000)	(0.625, 0.875, 0.958)	(0.750, 1.000, 1.000)
A14	(0.350, 0.600, 0.850)	(0.166, 0.416, 0.791)	(0.625, 0.875, 1.000)	(0.350, 0.600, 0.800)	(0.166, 0.416, 0.666)
A15	(0.550, 0.800, 0.950)	(0.416, 0.666, 0.792)	(0.458, 0.708, 0.875)	(0.350, 0. 600, 0.850)	(0.750, 1.000, 1.000)
A16	(0.050, 0.250, 0.450)	(0.500, 0.750, 0.916)	(0.330, 0.583, 0.830)	(0.250, 0.500, 0.750)	(0.750, 1.000, 1.000)
A17	(0.400, 0.650, 0.900)	(0.291, 0.500, 0.750)	(0.541, 0.791, 0.958)	(0.250, 0.450, 0.700)	(0.660, 0.916, 1.000)
A18	(0.350, 0.600, 0.700)	(0.416, 0.666, 0.833)	(0.208, 0.416, 0.666)	(0.350, 0.600, 0.850)	(0.416, 0.666, 0.916)
A19	(0.400, 0.700, 0.900)	(0.458, 0.708, 0.916)	(0.083, 0.250, 0.500)	(0.150, 0.300, 0.550)	(0.250, 0.500, 0.750)
A20	(0.350, 0.600, 0.700)	(0.625, 0.875, 1.000)	(0.750, 1.000, 1.000)	(0.541, 0.791, 0.916)	(0.750, 1.000, 1.000)
A21	(0.550, 0.800, 0.950)	(0.416, 0.666, 0.833)	(0.291, 0.500, 0.750)	(0.250, 0.400, 0.650)	(0.166, 0.416, 0.666)
A22	(0.650, 0.900, 1.000)	(0.531, 0.781, 1.000)	(0.750, 1.000, 1.000)	(0.650, 0.900, 0.950)	(0.750, 1.000, 1.000)
A23	(0.250, 0.500, 0.750)	(0.208, 0.430, 0.581)	(0.291, 0.541, 0.791)	(0.600, 0.850, 0.950)	(0.416, 0.666, 0.916)
A24	(0.200, 0.400, 0.650)	(0.250, 0.500, 0.750)	(0.625, 0.875, 1.000)	(0.450, 0.700, 0.900)	(0.583, 0.833, 1.000)
A25	(0.300, 0.550, 0.800)	(0.458, 0.750, 0.875)	(0.458, 0.708, 0.916)	(0.350, 0.600, 0.850)	(0.750, 1.000, 1.000)
A26	(0.500, 0.800, 0.950)	(0.500, 0.750, 0.916)	(0.541, 0.791, 0.916)	(0.350, 0.600, 0.850)	(0.333, 0.583, 0.833)

Step3) Normalize the fuzzy decision matrix: Having formed the decision-making matrix, the next step is to normalize the matrix by using formula (10).The results are presented in Table (5).

Table 5- Normalize Fuzzy Matrix of Decision-Making Matrix

	C1	C2	C3	C4	C5
A1	(0.650, 0.900, 1.000)	(0.584, 0.834, 0.958)	(0.750, 1.000, 1.000)	(0.428, 0.786, 0.928)	(0.750, 1.000, 1.000)
A2	(0.550, 0.800, 0.900)	(0.583, 0.833, 0.958)	(0.541, 0.791, 0.958)	(0.500, 0.750, 0.950)	(0.660, 0.916, 1.000)
A3	(0.650, 0.900, 1.000)	(0.583, 0.833, 0.958)	(0.666, 0.916, 0.958)	(0.350, 0.850, 0.950)	(0.750, 1.000, 1.000)
A4	(0.650, 0.900, 1.000)	(0.625, 0.875, 1.000)	(0.500, 0.750, 0.916)	(0.400, 0.650, 0.900)	(0.150, 0.750, 1.000)
A5	(0.450, 0.700, 0.850)	(0.541, 0.791, 0.916)	(0.625, 0.875, 1.000)	(0.650, 0.900, 1.000)	(0.500, 0.750, 0.833)
A6	(0.500, 0.750, 0.950)	(0.125, 0.330, 0.583)	(0.375, 0.625, 0.875)	(0.500, 0.750, 0.900)	(0.500, 0.750, 1.000)
A7	(0.400, 0.600, 0.800)	(0.458, 0.708, 0.958)	(0.625, 0.875, 1.000)	(0.458, 0.678, 0.857)	(0.583, 0.833, 1.000)
A8	(0.250, 0.500, 0.700)	(0.625, 0.875, 1.000)	(0.458, 0.708, 0.916)	(0.600, 0.850, 1.000)	(0.000, 0.083, 0.333)
A9	(0.700, 0.950, 1.000)	(0.531, 0.81, 0.938)	(0.563, 0.813, 1.000)	(0.333, 0.583, 0.833)	(0.417, 0.667, 0.917)
A10	(0.450, 0.700, 0.900)	(0.625, 0.875, 1.000)	(0.583, 0.832, 0.958)	(0.450, 0.700, 0.900)	(0.083, 0.333, 0.583)
A11	(0.550, 0.800, 0.900)	(0.458, 0.708, 0.916)	(0.125, 0.333, 0.583)	(0.600, 0.850, 1.000)	(0.166, 0.416, 0.666)
A12	(0.550, 0.800, 1.000)	(0.541, 0.791, 1.000)	(0.583, 0.833, 1.000)	(0.400, 0.650, 0.850)	(0.750, 1.000, 1.000)
A13	(0.600, 0.850, 0.950)	(0.666, 0.916, 1.000)	(0.625, 0.875, 1.000)	(0.625, 0.875, 0.958)	(0.750, 1.000, 1.000)
A14	(0.350, 0.600, 0.850)	(0.166, 0.416, 0.791)	(0.625, 0.875, 1.000)	(0.350, 0.600, 0.800)	(0.166, 0.416, 0.666)
A15	(0.550, 0.800, 0.950)	(0.416, 0.666, 0.792)	(0.458, 0.708, 0.875)	(0.350, 0.600, 0.850)	(0.750, 1.000, 1.000)
A16	(0.050, 0.200, 0.450)	(0.500, 0.750, 0.916)	(0.330, 0.583, 0.833)	(0.250, 0.500, 0.850)	(0.750, 1.000, 1.000)
A17	(0.400, 0.650, 0.900)	(0.291, 0.500, 0.750)	(0.541, 0.691, 0.958)	(0.250, 0.450, 0.700)	(0.660, 0.916, 1.000)
A18	(0.350, 0.600, 0.700)	(0.416, 0.666, 0.833)	(0.208, 0.416, 0.666)	(0.350, 0.600, 0.850)	(0.416, 0.666, 0.916)
A19	(0.400, 0.700, 0.900)	(0.458, 0.708, 0.916)	(0.083, 0.250, 0.500	(0.150, 0.300, 0.550)	(0.250, 0.500, 0.750)
A20	(0.350, 0.600, 0.700)	(0.625, 0.875, 1.000)	(0.750, 1.000, 1.000)	(0.541, 0.791, 0.916)	(0.750, 1.000, 1.000)
A21	(0.550, 0.800, 0.950)	(0.416, 0.666, 0.833)	(0.291, 0.500, 0.750)	(0.250, 0.400, 0.650)	(0.166, 0.416, 0.666)
A22	(0.650, 0.900, 1.000)	(0.531, 0.781, 1.000)	(0.750, 1.000, 1.000)	(0.650, 0.900, 0.950)	(0.750, 1.000, 1.000)
A23	(0.250, 0.500, 0.750)	(0.208, 0.330, 0.583)	(0.291, 0.541, 0.791)	(0.600, 0.850, 0.950)	(0.416, 0.666, 0.916)
A24	(0.200, 0.400, 0.650)	(0.250, 0.500, 0.750)	(0.625, 0.875, 1.000)	(0.450, 0.700, 0.950)	(0.583, 0.833, 1.000)
A25	(0.300, 0.550, 0.800)	(0.458, 0.708, 0.875)	(0.458, 0.708, 0.916)	(0.350, 0.600, 0.850)	(0.750, 1.000, 1.000)
A26	(0.550, 0.800, 0.950)	(0.500, 0.750, 0.916)	(0.541, 0.691, 0.916)	(0.350, 0.600, 0.850)	(0.333, 0.583, 0.833)

Step4) Construct weighted normalized fuzzy decision matrix: In the fourth step, the normalized matrix in table (5) should be converted into a normalize weighted matrix. For this purpose, the formula (13) was used. Therefore, the determined weights for each of the indexes have been multiplied by its normalized matrix. The results are shown in Table (6).

Table 6- The Normalize Weighted Matrix

	C1	C2	C3	C4	C5
A1	0.351, 0.666, 0.910)	(0.362, 0.683, 0.920)	(0.435, 0.780, 0.940)	(0.282, 0.676, 0.909)	(0.210, 0.580, 0.780)
A2	(0.297, 0.592, 0.819)	(0.362, 0.683, 0.920)	(0.314, 0.617, 0.900)	(0.330, 0.645, 0.931)	(0.185, 0.531, 0.780)
A3	(0.351, 0.666, 0.910)	(0.362, 0.683, 0.920)	(0.386, 0.715, 0.900)	(0.231, 0.731, 0.931)	(0.210, 0.580, 0.780)
A4	(0.351, 0.666, 0.910)	(0.387, 0.718, 0.960)	(0.290, 0.585, 0.861)	(0.264, 0.559, 0.882)	(0.042, 0.435, 0.780)
A5	(0.243, 0.518, 0.774)	(0.335, 0.648, 0.920)	(0.363, 0.683, 0.940)	(0.429, 0.774, 0.980)	(0.140, 0.435, 0.650)
A6	(0.270, 0.555, 0.865)	(0.077, 0.270, 0.560)	(0.218, 0.488, 0.823)	(0.330, 0.645, 0.882)	(0.140, 0.435, 0.780)
A7	(0.216, 0.444, 0.728)	(0.248, 0.581, 0.920)	(0.363, 0.683, 0.940)	(0.289, 0.583, 0.840)	(0.163, 0.483, 0.780)
A8	(0.135, 0.370, 0.637)	(0.388, 0.718, 0.960)	(0.266, 0.558, 0.861)	(0.396, 0.731, 0.980)	(0.000, 0.048, 0.260)
A9	(0.108, 0.259, 0.546)	(0.388, 0.718, 0.960)	(0.326, 0.634, 0.940)	(0.220, 0.501, 0.816)	(0.117, 0.387, 0.715)
A10	(0.243, 0.518, 0.819)	(0.388, 0.718, 0.960)	(0.338, 0.649, 0.900)	(0.297, 0.602, 0.882)	(0.023, 0.193, 0.455)
A11	(0.297, 0.592, 0.819)	(0.284, 0.580, 0.879)	(0.073, 0.260, 0.548)	(0.220, 0.501, 0.816)	(0.157, 0.472, 0.780)
A12	(0.297, 0.592, 0.910)	(0.335, 0.649, 0.960)	(0.338, 0.650, 0.940)	(0.264, 0.559, 0.831)	(0.210, 0.580, 0.780)
A13	(0.324, 0.629, 0.865)	(0.413, 0.751, 0.960)	(0.363, 0.683, 0.940)	(0.413, .0792, 0.938)	(0.210, 0.580, 0.780)
A14	(0.189, 0.444, 0.775)	(()0.103, 0.341, 0.759)	(0.363, 0.683, 0.940)	(0.231, 0.516, 0.784)	(0.046, 0.241, 0.519)
A15	(0.297, 0.592, 0.865)	(0.258, 0.546, 0.760)	(0.266, 0.553, 0.823)	(0.231, 0.516, 0.833)	(0.210, 0.580, 0.780)
A16	(0.027, 0.148, 0.410)	(0.310, 0.615, 0.879)	(0.165, 0.453, 0.783)	(0.165, 0.430, 0.735)	(0.210, 0.580, 0.780)
A17	(0.216, 0.481, 0.819)	(0.180, 0.410, 0.720)	(0.314, 0.617, 0.901)	(0.165, 0.387, 0.686)	(0.184, 0.531, 0.780)
A18	(0.189, 0.444, 0.637)	(0.258, 0.546, 0.800)	(0.121, 0.325, 0.626)	(0.231, 0516, 0.833)	(0.116, 0.386, 0.715)
A19	(0.216, 0.518, 0.819)	(0.284, 0.581, 0.879)	(0.048, 0.194, 0.570)	(0.099, 0.258, 0.539)	(0.070, 0.290, 0.585)
A20	(0.189, 0.444, 0.637)	(0.358, 0.718, 0.960)	(0.435, 0.780, 0.940)	(0.357, 0.680, 0.897)	(0.210, 0.580, 0.780)
A21	(0.297, 0.598, 0.865	(0.258, 0.546, 0.780)	(0.169, 0.390, 0.705)	(0.165, 0.344, 0.637)	(0.046, 0.241, 0.519)
A22	(0.297, 0.598, 0.865	(0.310, 0.615, 0.879)	(0.314, 0.617, 0.861)	(0.429, 0.71, 0.937)	(0.210, 0.580, 0.780)
A23	(0.135, 0.371, 0.685)	(0.129, 0.271, 0.560)	(0.169, 0.422, 0.744)	(0.396, 0.731, 0.931)	(0.116, 0.386, 0.715)
A24	(0.108, 0.338, 0.591)	(0.155, 0.410, 0.720)	(0.363, 0.683, 0.940)	(0.297, 0.602, 0.882)	(0.163, 0.483, 0.780)
A25	(0.16, 0.407, 0.728)	(0.284, 0.581, 0.840)	(0.266, 0.552, 0.861)	(0.231, 0.516, 0.833)	(0.210, 0.580, 0.780)
A26	(0.297, 0.598, 0.864)	(0.310, 0.615, 0.897)	(0.314, 0.617, 0.861)	(0.231, 0.516, 0.833)	(0.093, 0.338, 0.650)

Step 5) Determine the fuzzy positive-ideal solution (FPIS) and fuzzy negative-ideal solution (FNIS): After the formation of normalize weighted matrix, the positive ideal and negative ideal should be determined by using the formulas (14) and (15). Since the fuzzy numbers assigned to the valuation of each of the options against each of the indexes in table (2) lie in the range between 0 and 1, the positive ideal and negative ideal is presented as table (7).

Table 7- The Positive Fuzzy Ideal and Negative Fuzzy Ideal

Positive ideal	negative ideal	Index
(1, 1, 1)	(0, 0, 0)	C1
(1, 1, 1)	(0, 0, 0)	C2
(1, 1, 1)	(0, 0, 0)	C3
(1, 1, 1)	(0, 0, 0)	C4
(1, 1, 1)	(0, 0, 0)	C5

Step 6) Calculate the distance of each alternative from FPIS and FNIS: Formula (17) and (18) is used to obtain the distance of each option from the ideal positive solution and the ideal negative solution. The results are demonstrated in Tables 8 and 9.

Table 8- The Distance of Each Option From the Positive Ideal Solution

2.349	d_2^+	2.180	d_1^+
2.451	d_4^+	2.238	d_3^+
2.825	d_6^+	2.366	d_5^+
2.832	d_8^+	2.537	d_7^+
2.623	d_{10}^+	2.475	d_9^+
2.377	d_{12}^+	2.831	d_{11}^+
2.948	d_{14}^+	2.135	d_{13}^+
2.995	d_{16}^+	2.569	d_{15}^+
2.972	d_{18}^+	2.797	d_{17}^+
2.297	d_{20}^+	3.249	d_{19}^+
2.105	d_{22}^+	3.014	d_{21}^+
2.767	d_{24}^+	2.977	d_{23}^+
2.610	d_{26}^+	2.669	d_{25}^+

As an example, in table 8, d_1^+ is calculated as follows:

$$d_1^+ = \sqrt{\frac{1}{3}\left[(1-0.351)^2+(1-0.666)^2+(1-0.910)^2\right]}$$
$$+\sqrt{\frac{1}{3}\left[(1-0.362)^2+(1-0.683)^2+(1-0.920)^2\right]}$$
$$+\sqrt{\frac{1}{3}\left[(1-0.435)^2+(1-0.780)^2+(1-0.940)^2\right]}$$
$$+\sqrt{\frac{1}{3}\left[(1-0.282)^2+(1-0.676)^2+(1-0.909)^2\right]}$$
$$+\sqrt{\frac{1}{3}\left[(1-0.210)^2+(1-0.580)^2+(1-0.780)^2\right]}$$
$$=2.180$$

Table 9- The Distance of Each Option From the Negative Ideal Solution

3.194	d_2^-	3.372	d_1^-
3.171	d_4^-	3.346	d_3^-
2.772	d_6^-	3.157	d_5^-
2.664	d_8^-	3.011	d_7^-
2.889	d_{10}^-	3.088	d_9^-
3.207	d_{12}^-	2.692	d_{11}^-
2.603	d_{14}^-	3.399	d_{13}^-
2.506	d_{16}^-	2.937	d_{15}^-
2.508	d_{18}^-	2.727	d_{17}^-
3.194	d_{20}^-	2.227	d_{19}^-
3.439	d_{22}^-	2.443	d_{21}^-
2.746	d_{24}^-	2.519	d_{23}^-
2.919	d_{26}^-	2.868	d_{25}^-

For example, in Table 9, d_1^- has been calculated as follow:

$$d_1^- = \sqrt{\frac{1}{3}\left[(0-0.351)^2+(0-0.666)^2+(0-0.910)^2\right]}$$
$$+\sqrt{\frac{1}{3}\left[(0-0.362)^2+(0-0.683)^2+(0-0.920)^2\right]}$$
$$+\sqrt{\frac{1}{3}\left[(0-0.435)^2+(0-0.780)^2+(0-0.940)^2\right]}$$
$$+\sqrt{\frac{1}{3}\left[(0-0.282)^2+(0-0.676)^2+(0-0.909)^2\right]}$$
$$+\sqrt{\frac{1}{3}\left[(0-0.210)^2+(0-0.580)^2+(0-0.780)^2\right]}$$
$$= 3.372$$

Step 7) Obtain the closeness coefficient and rank the order of alternatives: Calculating the relative proximity of each option to ideal solution has been calculated using formula (19), and the results have been demonstrated in the table (10).

Table 10- The Amount of Proximity to the Ideal Solution for Each Option

Ranking	CC_i	Option	Ranking	CC_i	Option
21	0.469	A14	3	0.607	A1
12	0.533	A15	6	0.576	A2
24	0.455	A16	4	0.599	A3
17	0.494	A17	9	0.564	A4
23	0.457	A18	8	0.571	A5
26	0.407	A19	18	0.491	A6
5	0.581	A20	11	0.543	A7
25	0.448	A21	20	0.485	A8
1	0.620	A22	10	0.555	A9
22	0.458	A23	14	0.525	A10
16	0.500	A24	19	0.487	A11
15	0.518	A25	7	0.574	A12
13	0.528	A26	2	0.614	A13

Conclusion

Nowadays, CSR is increasingly gaining significance across the world. In Iran, too, CSR has attracted great attention in the recent years. Therefore, considering the importance of tourism industry, this research set out to rank the of five-star hotels in Iran from the perspective of CSR indexes.

For this purpose, after having analyzed the theoretical and empirical bases of CSR using the fuzzy TOPSIS method, ranking the five star hotels in our country was carried out. The method used in this research is advantageous in that it presents a mere rating of the existing options. Also, this method is used due to the nature of CSR, in which we are faced with the verbal variables, the measurement of which is somehow ambiguous.

Additionally, since CSR is a multi-dimensional concept, and considering the question of which features or indexes should be opted for to measure it, the applied method makes it possible for the effects of all the indexes to be considered simultaneously in measuring and rating the CSR.

References

Abo-Sinna, M. A. & Amer, A. H. (2005), Extensions of TOPSIS for multi objective large-scale nonlinear programming problems, *Applied Mathematics and Computation*, 162, 243–256.

Barraclough, S. & Morrow, M. A. (2008), grim contradiction: The practice and consequences of corporate social responsibility by British American Tobacco in Malaysia. *Social Science & Medicine*, 66, 1784-1796.

Carroll, A. B. (1999), Corporate Social Responsibility: Evolution of a Definitional Construct. *Business and Society*, 38, 268–295.

Carroll, A. B. (1991), The Pyramid of Corporate Social Responsibility: Towards the Moral Management of Organizational Stakeholders, *Business Horizons* (July/ August), 39–48.

Chamodrakas, A., N. & Martakos, D. (2009), Customer evaluation for order acceptance using a novel class of fuzzy methods based on TOPSIS, *Expert Systems with Applications*, 36, 7409–7415.

Chen, C. T. (2009), Extensions of the TOPSIS for group decision-making under fuzzy environment, Fuzzy *Sets and Systems*, 114, 1–9.

Chen, M. F., Tzeng, G.H. (2004), Combines grey relation and TOPSIS concept for selecting an expatriate host country, *Mathematical and Computer Modeling*, 40:1473-1490.

Ciliberti F., Pontrandolfo P & Scozzi B. (2008), Investigating Corporate Social Responsibility in Supply Chains: a SME Perspective. *J. Cleaner Prod*. 16: 1579-1588.

Ciliberti, F., Pontrandolfo, P. & Scozzi, B. (2008), Logistics social responsibility: Standard adoption and practices in Italian companies, *International Journal of Production Economics*, 113: 88–106.

Dagdeviren, M., Yavuz, S., & Kılınc, N. (2009), Weapon selection using the AHP and TOPSIS methods under fuzzy environment, *Expert Systems with Applications*,36: 8143–8151.

De Bakker FGA, Groenewegen P & den Hond F. A. (2005), Bibliometric Analysis of 30 Years of Research and Theory on Corporate Social Responsibility and Corporate Social Performance. *Business and Society Review*, 44: 283–317.

Van de Velde, E., Vermeir, W. & Corten, F. (2005), Corporate Social Responsibility and Financial Performance, *Corporate Governance*, 5, 129-138.

Falck, O. & Heblich, S. (2007), Corporate social responsibility: Doing well by doing good, *Business Horizons*, 50, 247–254.

Golob, U. & Bartlett, J. L. (2007), Communicates about corporate social responsibility: A comparative study of CSR reporting in Australia and Slovenia, *Public Relations Review*, 33, 1–9.

Gumus, A.T. (2009), Evaluation of Hazardous Waste Transportation Firms by Using a Two Step Fuzzy-AHP and TOPSIS Methodology, *Expert Systems with Applications*, 36: 4067–4074.

Henderson, J.C. (2007), Corporate social responsibility and tourism: Hotel companies in Phuket, Thailand, after the Indian Ocean tsunami, *Hospitality Management*, 26: 228–239

Holmqvist M (2009). Corporate Social Responsibility as Corporate Social Control: The Case of Work-Site Health Promotion. *Scandinavian J. Manage*, 25: 68-72.

Hwang CL, Yoon K. (1981), Multiple attributes decision making methods and applications, New York.

Inoue, Y. & Lee, *S. (2011), Effects of different dimensions of corporate social responsibility on corporate financial performance in tourism-related industries, Tourism Management*, 32: 790-804.

Kang, K.H., Lee, S., & Huh, C. (2010), Impacts of positive and negative corporate social responsibility activities on company performance in the hospitality industry, *International Journal of Hospitality Management*, 29: 72–82.

Kannan, G., Pokharel, S. & Kumar, P.S. (2009), A hybrid approach using ISM and fuzzy TOPSIS for the selection of reverse logistics provider, Resources, *Conservation and Recycling*, 54: 28–36.

Kelemenis, A. & Askounis, D. (2010), A new TOPSIS-based multi-criteria approach to personnel selection, *Expert Systems with* Applications, (2010) 37: 4999–5008.

Kuo, M.-S., Tzeng, G.-H. & Huang, W.-C. (2007), Group decision-making based on concepts of ideal and anti-ideal points in a fuzzy environment, *Mathematical and Computer Modeling*, 45: 324–339.

Lee S, Heo C. (2009), Corporate Social Responsibility and Customer Satisfaction among US Publicly Traded Hotels and Restaurants, *International Journal of Hospitality Management*, 28: 635-637.

Li, D.-F. (2007), Compromise ratio method for fuzzy multi-attribute group, *Applied Soft Computing*, 7: 807–817.

Lynes J.K., Andrachuk M. (2008), Motivations for Corporate Social and Environmental Responsibility: A Case Study of Scandinavian Airlines, *J. Int. Manage*. 14: 377–390.

Pakdin Amiri, M. (2010), Project selection for oil-fields development by using the AHP and fuzzy TOPSIS methods, Expert Systems with Applications, 37: 6218–6224.

Rajat Panwar, R., Han, X., & Hansen, E. (2010), A demographic examination of societal views regarding corporate social responsibility in the US forest products industry, *Forest Policy and Economics*, 12: 121–128.

Sun, C. C. A. (2010), performance evaluation model by integrating fuzzy AHP and fuzzy TOPSIS methods, *Expert Systems with Applications*.

Sun, C.-C., & Lin, G.T.R. (2009), Using fuzzy TOPSIS method for evaluating the competitive advantages of shopping websites. *Expert Systems with Applications*, 36: 11764–11771.

Torfi, F., Zanjirani, R.Z., & Rezapour, S. (2010), Fuzzy AHP to determine the relative weights of evaluation criteria and Fuzzy TOPSIS to rank the alternatives, *Applied Soft Computing*, 10: 520–528.

Tsai, W-H., Hsu, J.L., Chen, C-H., Lin, W-R. & Chen, S-P. (2010), An integrated approach for selecting corporate social responsibility programs and costs evaluation in the international *tourist hotel. International Journal of Hospitality Management, 29, 385–396.*

Van den Bossche, F., Rogge, N., Devooght, K. & Van Puyenbroeck, T. Robust.(2010), Corporate Social Responsibility investment screening. Ecological Economics69: 1159–1169.

Wang, J., Fan, K., & Wang, W. (2010), Integration of fuzzy AHP and FPP with TOPSIS methodology for aero engine health assessment, *Expert Systems with Applications*.

Wang, J. W., Cheng, C. H., & Cheng, H. K. (2009) Fuzzy hierarchical TOPSIS for supplier selection, *Applied Soft Computing*9: 377–386.

Wang, M. J.J., & Chang, T. C. (1995), Tool steel materials selection under fuzzy environment, *Fuzzy Sets and Systems* 72, 263–270.

Wang, T.C., & Chang, T.H. (2007), Application of TOPSIS in evaluating initial training aircraft under a fuzzy environment, *Expert Systems with Applications*, 33: 870–880.

Wang, Y.-J., & Lee, H. S. (2007), Generalizing TOPSIS for fuzzy multiple-criteria group decision-making, *Computers and Mathematics with Applications*, 53: 1762–1772.

Wang, Y.M. & Elhag, T.M. (2006), Fuzzy TOPSIS method based on alpha level sets with an application to bridge risk assessment. *Expert Systems with Applications* 31: 309–319.

Watts P, Holme L. (1999), Meeting Changing Expectations: Corporate Social Responsibility, *World Business Council for Sustainable Development*.

Weber, M., The business case for corporate social responsibility: A company-level measurement approach for CSR, *European Management Journal*, (2008) 26: 247– 261.

Yang, T., & Hung, C. C. (2007), Multiple-attribute decision making methods for plant layout design problem, *Robotics and Computer-Integrated Manufacturing*, 23: 126–137.

Yurdakul, M. & Tansel ˙Ic, Y. (2009), Analysis of the benefit generated by using fuzzy numbers in a TOPSIS model developed for machine tool selection problems, *Journal of materials processing technology*, 209: 310–317