

2014

BioTechnology

An Indian Journal

FULL PAPER

BTAIJ, 10(16), 2014 [9023-9028]

The design and application of corporate social responsibility evaluation index system from the perspective of stakeholders

Yunhong Li, Ling Xia*

School of Business Administration of University of Science and Technology

Liaoning, Anshan, P.R. (CHINA)

E:mail : x1a2@163.com

ABSTRACT

This paper explored the question that how to establish a comprehensive and objective evaluation system of corporate social responsibility (CSR) in China. The aim of this paper is to investigate analytic framework of quantitative evaluation index system of CSR in accordance with economic reality in China. This paper determines the contents of stakeholders from the perspective of stakeholders, based on which this paper establishes evaluation index system of CSR by fuzzy comprehensive evaluation and makes an application analysis in case of COFCO Group, in order to provide quantitative basis for public to supervise and evaluate CSR fulfillment.

KEYWORDS

Corporate social responsibility; Stakeholders; Evaluation index system; Fuzzy comprehensive evaluation; Application analysis.



INTRODUCTION

In recent years, with the rapid development of the economy in our country, research on corporate social responsibility (CSR) has been risen from qualitative research to quantitative research. How to choose the proper CSR evaluation indexes is the basis of quantitative research, which is the important causes of unsatisfying CSR fulfillment in China. Evaluation of CSR refers to the evaluation the fulfillment CSR in enterprise by scientific method in specific target and standard, to which Chinese and foreign scholars have made a lot of contributions, accumulating a large amount of experience and lessons.

Within foreign studies about CSR evaluation, Clarkson has classified stakeholders management as a strategy and modified RDAP scale which provides more clear definition of CSR. In addition, Clarkson made a preliminary comparison of CSR level by combination with Carroll's three-dimensional CSR performance model^[1]. The Dow Jones Index announced CSR sustainable development index in 2005, by which CSR evaluation index system is divided into two categories: general standards and specific standards. The Dow Jones Sustainability Index of CSR laid the foundation for the detailed evaluation standard, which firstly consider differences among industries.

Within Chinese studies about evaluation CSR, Qi Wenhao and Liu Yujun constructed the evaluation index system including economic responsibility, regulations responsibility, safety responsibility, environmental liability and public charity responsibility. In addition, they completed the empirical test of the index system through the hierarchy analysis (AHP)^[2]. Zhao Tianyan and Zhang Xue built CSR evaluation index system including shareholders, creditors, employees, consumers, suppliers, government and public welfare establishments, and found that CSR performance has a significant difference not only in different industries, but also in different factors of the same industry^[3]. Zhang Lijun, Ma Xiao and LI Min established the multi-level evaluation index system of enterprises' ability to fulfill social responsibility and the synthesis evaluation model of enterprises' ability to fulfill social responsibility and elaborates on it^[4].

To sum up, we can find that there are different evaluation emphases and without unified evaluation objects of CSR at present. Moreover, corresponding evaluation indexes system need to be developed. Due to uncertain and fuzzy factors and its widespread content of CSR. Therefore, the establishment of CSR index set, evaluation set and weight set in of fuzzy comprehensive evaluation based on the stakeholders contributes to improve the effectiveness and rationality of comprehensive evaluation results.

CSR BASED ON STAKEHOLDER THEORY

In 1960s, in English and American companies, "shareholders first" concept made its development encounter greater difficulties and questioned because its managers tend to focusing on the short term goals and ignoring long-term development. While in Germany and Japan and other countries, which pay attention to interests of creditors and employees and other injected the business philosophy of humanism due to internal monitor mode, they gained rapid development and guide the economy development. In this context, scholars began to research on the stakeholder theory.

An internal memo Stanford University Institute in 1963 firstly proposed the stakeholders concept, which insisted that enterprise will no longer exist without the support of stakeholders. Freeman defined stakeholders as: "an organization's stakeholders can affect organization's goals by effects of group or individual"^[5,6], he believed that the stakeholders are those groups who have interest or claim in company. CSR based on the stakeholder theory is viewed as a process that it undertakes various stakeholders' responsibility (including suppliers, customers, employees, shareholders, local community and government) in clear goals and plans^[7]. The basic requirements of CSR is to fulfill corresponding obligations for different stakeholders, with the ultimate goal of harmonious and sustainable development both for enterprise and society.

DESIGN OF CSR EVALUATION INDEX SYSTEM

Design of CSR evaluation index

(a) Design principle

The design principle of CSR evaluation index can be in accordance as follows:

- (1) Correlation. The selection of index should reflect directly stakeholder's CSR.
- (2) Systematicness. the appraisal object of Multi index comprehensive evaluation should promote CSR of enterprise with comprehensive systematically important indexes which can reflecting CSR fulfillment, in order to ensure the scientific truth of CSR evaluation.
- (3) Measurability. The evaluation index should mainly select financial indexes as far as possible in order to reduce fuzzy judgment subjectively^[8].
- (4) Operability. The selected indexes should be representative and operable.

(b) Evaluation index system

Combined current situation and stakeholder theory, enterprise's stakeholders are divided into six categories including shareholders, consumers, employees, suppliers, community and government, on this basis CSR evaluation index system includes 6 first-class indexes and 17 corresponding second-class indexes as shown in TABLE 1.

TABLE 1 : CSR evaluation Index System

CSR evaluation objects	First-class indexes	Second-class indexes
CSR based on stakeholder	Shareholders U ₁	Return on equity U ₁₁
		Return on total assets U ₁₂
		Rate of capital-value maintaining and increase U ₁₃
	Consumers U ₂	Quality product rate U ₂₁
		Customer satisfaction U ₂₂
	Employees U ₃	Wages payout ratio U ₃₁
		5 insurances & housing fund coverages U ₃₂
		Per-education funds rate U ₃₃
	Suppliers U ₄	Turnover ratio of account payable U ₄₁
		Cash and accounts payable ratio U ₄₂
		Contracts-fill rate U ₄₃
		Responsible for purchase ratio U ₄₄
	Community U ₅	Employment contribution rate U ₅₁
		Donation-sales rate U ₅₂
	Government U ₆	Environmental protection investment rate U ₅₃
		Taxes -asset ratio U ₆₁
		Rate of social security extraction U ₆₂

Index weight of CSR evaluation index system

(a) Set of CSR evaluation level

CSR evaluation based on the stakeholders adopts five level evaluation, evaluation V={V1, V2, V3, V4, V5}={excellent, good, medium, poor, very poor}, with an assignment of {95, 85, 75, 65, 55}.

(b) Calculation of first-class index weight

This paper adopted analytic hierarchy process (AHP) method to calculate the weight of two level indexes. Firstly, constructing judgment matrix of two level indexes; secondly, calculating maximal eigenvalues and consistency test by computer; finally, obtaining their weight.

Firstly, for the 6 first-class indexes given, the judgment matrix is constructed as follows:S=

$$\begin{bmatrix}
 1 & 2 & 1 & 2 & 1 & 3 \\
 \frac{1}{2} & 1 & \frac{1}{2} & 1 & \frac{1}{2} & 2 \\
 1 & 2 & 1 & 2 & 1 & 3 \\
 \frac{1}{2} & 1 & \frac{1}{2} & 1 & \frac{1}{2} & 2 \\
 \frac{1}{2} & 2 & \frac{1}{2} & 2 & 1 & 3 \\
 \frac{1}{3} & \frac{1}{2} & \frac{1}{3} & \frac{1}{2} & \frac{1}{3} & 1
 \end{bmatrix}$$

Secondly, maximal eigenvalues of judgment matrix S is calculated as: $\lambda_{max}=6.0172$; Besides, consistency index (CI) should be calculated for the coincidence test of judgment matrix: $CI = \frac{\lambda_{max} - n}{n - 1} = \frac{6.0172 - 6}{6 - 1} = 0.00344$. According to TABLE 2, it shows that RI=1.24 and consistency rate (CR) : $CR = \frac{CI}{RI} = \frac{0.00344}{1.24} = 0.00277 < 0.10$. Therefore, judgment matrix coincidence is satisfied, showing the weighted coefficient is reasonable.

TABLE 2 : Average random consistency index

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

Finally, weighted coefficient matrix can be calculated W=(0.2323, 0.1161, 0.2323, 0.1161, 0.2323, 0.0709)

(c) Calculation of second-class index weight

According to the calculation procedures mentioned above, this paper sets W1, W2, W3, W4, W5, W6 respectively standing for six stakeholders' second-class index weights, they can be obtained as follows:

W1=(0.297, 0.164, 0.539); W2=(0.250, 0.750); W3=(0.420, 0.380, 0.200) ;W4=(0.480, 0.240, 0.160, 0.120); W5=(0.167, 0.333, 0.500); W6=(0.667, 0.333)

APPLICATION OF CSR EVALUATION INDEX SYSTEM —IN THE CASE OF COFCO

Sample source and data processing

Combined with the disclosure information of COFCO during 2009-2013 CSR reports and financial statements, this paper adopted experts evaluating method by invited 10 experts engaged in financial evaluation and CSR to evaluate COFCO's fulfillment of CSR by questionnaire survey, then arrived at their comments. Thus, the six evaluation vectors can be obtained. The evaluation set is shown in TABLE 3.

TABLE 3 : The evaluation sets of indexes

First-class indexes	Second-class indexes	V ₁	V ₂	V ₃	V ₄	V ₅
U ₁	U ₁₁	0.2	0.6	0.2	0	0
	U ₁₂	0	0.6	0.4	0	0
	U ₁₃	0.1	0.5	0.4	0	0
U ₂	U ₂₁	0.2	0.5	0.3	0	0
	U ₂₂	0.1	0.4	0.4	0.1	0
U ₃	U ₃₁	0.1	0.6	0.3	0	0
	U ₃₂	0	0.5	0.4	0.1	0
	U ₃₃	0.1	0.5	0.4	0	0
	U ₄₁	0.1	0.6	0.3	0	0
U ₄	U ₄₂	0	0.6	0.3	0.1	0
	U ₄₃	0.2	0.5	0.3	0	0
	U ₄₄	0.1	0.6	0.3	0	0
U ₅	U ₅₁	0.1	0.7	0.2	0	0
	U ₅₂	0.3	0.6	0.1	0	0
U ₆	U ₅₃	0.1	0.6	0.3	0	0
	U ₆₁	0	0.6	0.3	0.1	0
	U ₆₂	0	0.6	0.4	0	0

Fuzzy comprehensive evaluation on CSR

The data of evaluation set can be imported to the model, then calculating each vector of fuzzy comprehensive evaluation on COFCO's CSR fulfillment. Set A1 as the fuzzy synthetic result of second-class indexes including U11, U12, U13; Set A2 as the fuzzy synthetic result of second-class indexes including U21, U22; similarly, we can get the remaining fuzzy synthesis results A3, A4, A5, A6 respectively standing for corresponding second-class indexes.

Set B as fuzzy comprehensive evaluation result. Fuzzy compositional operations are defined as follows: B=W ◦ R by the operator of $M^{(\bullet, \oplus)}$. The synthesizing procedure is started from last index set to the upper. Thus, CSR comprehensive evaluation results of can be arrived at according to corresponding evaluation based on its score.

Model solution of fuzzy comprehensive evaluation

(a) CSR evaluation vector for each stakeholder category

$$A_1 = (0.297 \quad 0.164 \quad 0.539) \circ \begin{bmatrix} 0.2 & 0.6 & 0.2 & 0 & 0 \\ 0 & 0.6 & 0.4 & 0 & 0 \\ 0.1 & 0.5 & 0.4 & 0 & 0 \end{bmatrix} = (0.113, 0.546, 0.341, 0, 0)$$

Similarly, we can get A2, A3, A4, A5, A6 as follows.

A2=(0.125, 0.425, 0.375, 0.075, 0); A3=(0.062, 0.542, 0.358, 0.038, 0); A4=(0.092, 0.584, 0.3000, 0.024, 0); A5=(0.167, 0.616, 0.217, 0, 0); A6=(0, 0.6, 0.333, 0.067, 0)

(b) Comprehensive CSR evaluation vector

$$B = W \circ R = W \circ \begin{pmatrix} A_1 \\ A_2 \\ A_3 \\ A_4 \\ A_5 \\ A_6 \end{pmatrix} = (0.2323 \quad 0.1161 \quad 0.2323 \quad 0.1161 \quad 0.2323 \quad 0.0709) \circ \begin{pmatrix} 0.113 & 0.546 & 0.341 & 0 & 0 \\ 0.125 & 0.425 & 0.375 & 0.075 & 0 \\ 0.062 & 0.542 & 0.358 & 0.038 & 0 \\ 0.092 & 0.584 & 0.300 & 0.024 & 0 \\ 0.167 & 0.616 & 0.217 & 0 & 0 \\ 0 & 0.6 & 0.333 & 0.067 & 0 \end{pmatrix}$$

$$= (0.10450, 0.55555, 0.31467, 0.02505, 0) .$$

Taking a normalization of B, we can get B*=(0.105, 0.556, 0.314, 0.025, 0). Thus, comprehensive evaluation score is obtained: Z=(0.105, 0.556, 0.314, 0.025, 0) * [95 85 75 65 55]^T=82.341.

Results analysis of COFCO

Based on the fuzzy comprehensive evaluation model of CSR established in this paper, the score of COFCO is 82.341, which indicates that the comprehensive performance of COFCO’s CSR is "good".

From the scores of second-class indexes in the CSR evaluation model above, it is obvious that COFCO’s CSR fulfillment for its stakeholders is in the upper level. Although, COFCO’s CSR performance is overall good, as leading enterprise in the supply chain of food processing enterprises, COFCO achieved a dominant position in the increasingly closer supply chain. Therefore, COFCO should be more actively in fulfilling CSR to promote sustainable development of the enterprises in supply chain.

COUNTERMEASURE OF CSR

To consummate CSR information disclosure system

At present, there are many approaches of CSR information disclosure in China. The different CSR information carriers, emphases and approaches to compiling CSR reports, making CSR reports more subjective and artificial controlled. Meanwhile, it prevented CSR reports in different companies from being well-compared. Therefore, it is indispensable to establish a standardized disclosure system of CSR reporting in different industries and establish a standardized CSR report disclosure, which should satisfy CSR information requirements from various stakeholders in order to provides support for CSR evaluation.

To adequately display government's stimulus role

The strength of government is indispensable, which is mainly manifested in the following two aspects: On the one hand, combining recent development of companies and industries, government should organize relevant institutions and scholars to explore CSR evaluation index system in China; On the other hand, when relative evaluation index system construction is completed, government should promote its application of evaluation index system, and investigate practicability and practical value of the system. Moreover, for the problems found in practice, government should promptly organize the relevant departments to revise and perfect them. In addition, due to the public goods characteristic of enterprise’s CSR, government should take incentive measures and preferential policies for enterprises to fulfill their CSR through related mechanism and its influence.

To adequately display Leading enterprises' exemplary role

In the supply chain system, because the node enterprises are asymmetric in economic benefits and CSR, thus the content and degree of CSR in each enterprise are also different. Enterprises should undertake corresponding CSR according to its position and function in the supply chain. As the key node in the supply chain, leading enterprises should play a key role in improving supply chain’s standards and advocate to establish a series of complete CSR promoting mechanism, in which enterprise’ CSR on its suppliers will react on the downstream enterprises, that is, enterprises will also benefit from the supplier’s CSR behavior.

CONCLUSIONS

Based on stakeholder theory, this paper constructed CSR evaluation index system by selecting CSR and weight them by AHP method. Moreover, this paper took COFCO as an example to investigate the application of CSR evaluation index system. The information of COFCO’s CSR reports and financial statements provided quantitative basis for experts evaluating method. To a certain extent, it weakened the subjectivity of experts evaluating method. Besides, the application of COFCO can be of stronger operability. Finally, it provided a quantitative reference for public to monitor and evaluate enterprise’s CSR and it has certain practical significance for the requirements.

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