

ASSESSMENT OF CORPORATE SOCIAL RESPONSIBILITY BY USING AHP METHOD TOGETHER WITH GROUP DECISION MAKING

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Abstract

A broad thematic range of the CSR concept integrating a large quantity of scientific fields and expert opinions lead to a terminological disunity resulting in many various definitions. Nowadays, an exact measurement is a very questionable and difficult task. The main goal of this paper is connected with a complex CSR assessment of selected banking organizations operating in the Czech Republic (Česká spořitelna, a.s., Komerční banka, a.s. and UniCreditbank Czech Republic, a.s.) by using the Analytic Hierarchy Process method (AHP). To overcome a subjectivity following from an individual expert's opinion a group of academics and non-academic were asked to participate in a preferences appraisal of criteria and sub-criteria of a hierarchically structured decision-making task based on Saaty's Pairwise Comparison method. Final results are described with respect to a distributive mode synthesis and an ideal mode synthesis. Both syntheses bring the same ranking of the organizations within the sample. Česká spořitelna, a.s. achieves the best scores and it is considered to be the ideal in all economic and social sub-criteria. Komerční banka, a.s. takes a second place and it achieves the ideal values in the whole environmental field. UniCreditbank Czech Republic, a.s. is placed in the third position.

Key words: Analytic Hierarchy Process, Business Ethics, Corporate Social Responsibility, group decision making

JEL Code: M14, L21

Introduction

In 1953 the American economist Howard R. Bowen (Putnová and Seknička, 2007) introduced his book named Social Responsibility of Businessman that served as a source of inspiration for the title of the special study named Corporate Social Responsibility (in short CSR). Specialized research centres focusing on the exploration of this dynamically developing field

have gradually emerged. Moreover, organizations supporting and promoting the sustainable and responsible entrepreneurship have been established worldwide.

Due to a spontaneous development of the CSR study integrating a plenty of scientific disciplines and expert opinions, a diverse terminology relating to various measurement methods causes difficulties connected with different interpretations of CSR results and performance. The main goal of this paper is focused on the evaluation of CSR activities in selected banking organizations by applying the AHP method together with group decision making. A theoretic part of this paper is focused on more detailed characteristic of the CSR concept and contemporary possibilities of CSR measurement. The AHP method is described in Chapter 2, followed by a result section.

1 Theoretical Background of Corporate Social Responsibility and its evaluation

The stockholder theory (1970) by Milton Friedman together with Richard Edward Freeman's stakeholder theory (1984) represents foundations of the CSR concept that, in fact, polarize opinions of these issues (Putnová and Seknička, 2007). The mutual dependence, following from the stakeholder theory, is evident for example in a Green Paper (2001) by European Commission describing CSR as "a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis."

According to Kunz (2012) a long-term orientation, a systematic approach and voluntariness together with unlimited possibilities of a practical application are considered to be characteristic features of the CSR definitions. Contemporary Czech authors such as Pavlík and Bělčík (2010) are familiar with a triple-bottom-line concept presented also by the European Union that includes three basic areas of interest: Profit, Planet and People. A responsible organization conducts business transparently, respects Corporate Governance rules, ethical marketing policies and ethical codes, pays attention to quality, innovations or safety and is universally beneficial to its community (**Profit**). An environmentally sustainable organization uses environment-friendly technologies, supports their development and reduces its environmental impacts (**Planet**). A responsible organization also fully respects human rights, occupational health standards and is fair in relation to its stakeholders (**People**).

The level of a systematic assessment of CSR activities in organizations is dependent on individual understanding of the CSR principles by owners, managers and employees, together with their internal explanations of the necessity of a permanent implementation,

monitoring and a regular evaluation of this above-standard commitment. Publicly presented CSR results could be considered as an opportunity to gain a competitive advantage, however, especially small organizations operating regionally take a responsible conduct of business for granted. There are several possibilities to evaluate CSR activities: a special audit, a certification or a quality mark. All these tools used for measurement of the corporate social responsibility performance differ in their methodologies, complexity and range of a suitable application in various business sectors or organization structures. Nowadays, socially responsible investing is considered to be an emerging trend, represented by diverse sustainability indices. Their main deficiency is connected with the fact that only the world's largest companies whose stocks are marketable in global stock markets are tracked. A separate category of evaluation tools is represented by non-financial reporting initiatives based on a regular publication of CSR reports that could be used as a communication medium informing about the CSR progress as well as managerial instrument providing a survey of CSR results (for detailed information see Pavlík and Bělčík, 2010; White, 2009). Regardless of the legal form of the organizations it is possible to apply a content analysis to evaluate or mutually compare CSR activities mentioned in CSR reports, internet pages and presentations. Practical examples of CSR evaluation possibilities and tools are given in Table 1.

Tab. 1: Summary of CSR evaluation tools and methods

Certification/ Guidance	Specialization	Organization
AA 1000	Evaluation of CSR principles application	<i>AccountAbility</i>
ISO 14001, ISO 14004	Environmental management system	<i>International Organization for Standardization</i>
ISO 26000	Guidance on reliable CSR strategy	<i>International Organization for Standardization</i>
Quality Label	Appraisal of CSR strategy complexity from stakeholders' point of view	<i>Forum Ethibel</i>
CSR Evaluation Methodology	Specialization	Organization
International Standard for Measuring Corporate Community Investment	Corporate community investment	<i>London Benchmarking Group</i>
Sustainability Indices	Specialization	Organization
Ethibel Sustainability Index	CSR performance evaluation of the world's largest companies whose stocks are marketable in global stock markets	<i>Forum Ethibel</i>
Dow Jones Sustainability Indices		<i>RobecoSAM</i>
FTSE4Good		<i>London Stock Exchange Group</i>
Non-financial Reporting	Specialization	Organization
G3. 1 Guidelines	CSR reporting methodology and forms	<i>Global Reporting Initiative</i>

Source: own adaptation (Forum Ethibel, 2013; Global Reporting Initiative, 2013; ISO, 2013; RobecoSAM, 2013)

2 Analytic Hierarchy Process

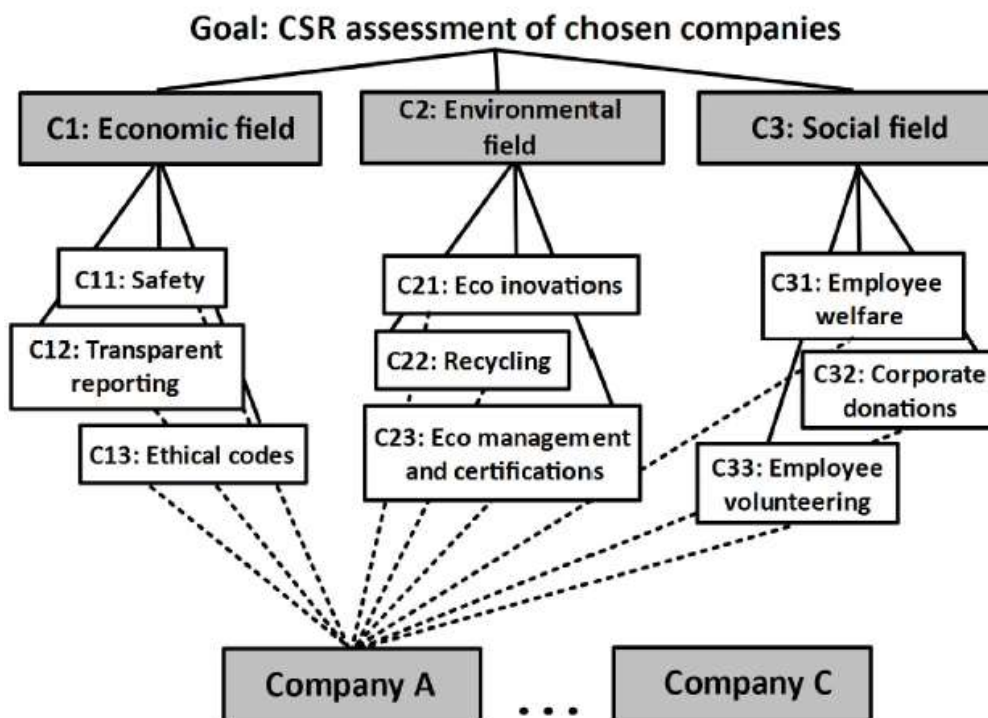
The AHP method was first introduced by its author Thomas L. Saaty at the beginning of 1970s. This method has been presented as an efficient and useful tool for multiple-criteria decision making, overcoming obstacles of intuitive decisions. The AHP is based on the innate human ability to use information and experience during various decision-making processes that also participate in a systematic decomposition of a chosen problem into its smaller constituent parts, forming a hierarchic structure. The first level of a hierarchy is usually represented by a clear specification of decision-making goals or tasks. The second level is connected with a formulation of criteria influencing a final decision while the third layer includes sub-criteria giving accuracy to every criteria belonging to the previous level. Finally, the fourth level symbolizes a list of considered options between which decision-making processes are realized (Saaty, 2000). In the field of CSR the AHP could be used in decision-making processes resulting in a selection of the optimal way of reaction or behavioural pattern (for examples see Beno, Drieniková, Nano and Sakal, 2012). On the other hand, the AHP could participate in the evaluation and measuring of the CSR activities (see Ruf, Muralidhar and Paul, 1998). Chen and Fan (2011) recommend combining the AHP with a fuzzy set modelling in order to measure the CSR performance.

First of all, it is necessary to create a hierarchic network with respect to a main goal that is connected with the evaluation of CSR activities of three selected organizations operating in the Czech banking sector. Each criterion is chosen according to the triple-bottom-line definition of CSR (see Chapter 1) while it is specified by three sub-criteria. The graphic representation of the hierarchic structure together with the indication of criteria, sub-criteria and options (organizations) is shown in Fig. 1.

Before a beginning of pairwise comparisons appropriate number of Saaty's matrices (symbolically marked by S) corresponding with a hierarchic structure has to be prepared. The Saaty's matrix has as many rows and columns as there is the amount of components (criteria, sub-criteria and options) of each hierarchical level. The judgements are written in the matrix according to estimated importance (preference) of the components. When the components in rows are preferred to those in columns, then a numerical expression of magnitudes ranges between $\langle 1; 9 \rangle$. Value 1 corresponds with an equal importance (indifference), number 3 means "moderately more", number 5 "strongly more", number 7 "very strongly more" and number 9 "extremely more". The values 2, 4, 6 and 8 are used to express a compromise or an intermediate stage of the ratio scale. In the opposite case estimated magnitudes are expressed

on an inverse scale ranging between $\langle 1/2; 1/9 \rangle$. The matrix is reciprocal which means that its elements, marked $s_{i,j}$, which are symmetric with respect to the diagonal, are inverses of one another, $s_{i,j} = 1/s_{j,i}$. Moreover, the elements on the diagonal express equality and are assigned to the value 1 (Saaty, 2000; Zmeškal 2012).

Fig. 1: Hierarchic decomposition of decision-making task



Source: own adaptation according to the CSR definitions (Bartošová, 2006b; Pavlík and Bělčík, 2010)

To overcome a subjectivity following from an individual expert's opinion a group of five academics and non-academic is involved in a preferences appraisal of criteria and sub-criteria. Each of the experts has to fill his or her judgements in matrices individually. Their opinions are synthetized according to the deterministic approach based on computations of a geometric mean according to a formula:

$$\left(\prod_{i=1}^m x_1 \right)^{\frac{1}{m}}, \dots, \left(\prod_{i=1}^m x_n \right)^{\frac{1}{m}}, \quad (1)$$

where x_1, \dots, x_n are rankings of n criteria and sub-criteria by m independent experts (Saaty and Vargas, 2012). A CSR performance of three banking organization is appraised by author's opinions based on information got from a content analysis of current internet

presentations, CSR reports and other available publications and surveys. Česká spořitelna, a.s. is marked with the expression “Organization A”, Komerční banka, a.s. is “Organization B” and finally UniCreditbank Czech Republic, a.s. is “Organization C”. According to the results of the Czech Top 100 Most Admired Firms survey held in 2013 all of these organizations are considered to be an essential part of the Czech banking sector.

Once all paired comparisons on every hierarchical level are made a computation of normalized local weights w_i , representing a contribution to the parent node in the level immediately above, follows. Local weights w_i could be calculated for example by using geometric mean of rows of Saaty’s matrix S according to a mathematic formula (1), where N represents the order of Saaty’s matrix S with elements $s_{i,j}$.

$$w_i = \frac{v_i}{\sum_i v_i} = \frac{\left[\prod_j^N s_{i,j} \right]^{\frac{1}{N}}}{\sum_i \left[\prod_j^N s_{i,j} \right]^{\frac{1}{N}}}, \quad (2)$$

A requirement of meeting the transitivity condition resulting in the demanded consistency of Saaty’s matrices is necessary to obtain a high-quality evaluation and reliable results. To assess the consistency an eigenvalue λ_{max} must be computed with respect to a mathematic procedure given below:

$$\lambda_{max} = \frac{1}{N} \sum_i^N (S \cdot w)_i / w_i, \quad (3)$$

where N is the order of Saaty’s matrix S , w symbolizes an eigenvector of weights w_i and $(S \cdot w)_i$ stands for i -th element of vector w . A next step is connected with a calculation of the Consistency Index (CI) according to a formula:

$$CI = \frac{\lambda_{max} - N}{N - 1}. \quad (4)$$

The whole procedure of the consistency evaluation is finished by a computation of the Consistency Ratio (CR):

$$CR = \frac{CI}{RI}, \quad (5)$$

while the Random Index (RI) is determined empirically depending on the order of Saaty's matrix S and ranging values mentioned in Table 2. The value of Consistency Index must definitely meet a condition: $CR \leq 0,1$.

Tab. 2: Summary of RI values

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

Source: Zmeškal (2012)

To obtain the global importance of each sub-criterion considering the overall goal (W_{ij}), the local weights of criterion w_i are multiplied by the local weights of the j -th sub-criterion according to its effect on the i -th criterion:

$$W_{i,j} = w_i \cdot w_{i,j} \quad (6)$$

A similar procedure is applied in the final evaluation of the chosen options that are compared with respect to each sub-criterion representing the most detailed level of evaluated CSR activities. After a computation of global weights of each option, organization, it is necessary to count them separately for each option. The AHP method is based on a principle of utility maximization that is why the option with the highest sum of the global weights is chosen. This method is called a distributive mode synthesis. Another solution of this task could be brought by an ideal mode synthesis that is connected with a relative expression of the global weights, while an ideal value is represented by 100 % (Saaty, 2000).

3 Results

The global weights ($W_{i,j}$) are considered to be the most important result, reflecting a relative participation of each sub-criterion in the overall goal, that is afterwards used for a detailed organization comparison and CSR evaluation. Preferences of the criteria and the sub-criteria are assigned according to opinions of five experts. A summary of computed local and global weights is given in Table 3. In view of the fact that the selected organizations represent the Czech banking sector the economic field (C1) is rated to be the most preferred criterion. Its local weights w_i have a relative value of approx. 75 %. The social field (C2) with 18 % follows and finally the environmental criterion (C3) with nearly 7 % is the least preferred one. It is obvious that this division of preferences has affected values of the global weights $W_{i,j}$. The economic sub-criterion C11 connected with an overall safety which means responsible

investment, an observance of occupational health and safety standards, fair behaviour of managers and staff etc. plays the key role because its global weights $W_{i,j}$ have a relative value of 44, 35 %. The next important sub-criteria deal with the topics of transparent reporting activities (C12; 18, 14 %) and a usage of ethical codes (C13; 12, 02 %). The less preferred factors are connected with environmental management systems and certifications (C23), ecological innovations (C21) and employee volunteering programs (C33).

Tab. 3: Overview of local and global weights

Criteria	C1			C2			C3			Sum
Local w_i	0,7451			0,0731			0,1818			1,0000
%	74,51%			7,31%			18,18%			100,00%
Sub-criteria	C11	C12	C13	C21	C22	C23	C31	C32	C33	
Local $w_{i,j}$	0,5952	0,2435	0,1613	0,3044	0,3975	0,2982	0,4804	0,3833	0,1363	
Global $W_{i,j}$	0,4435	0,1814	0,1202	0,0223	0,0291	0,0218	0,0873	0,0697	0,0248	1,0000
%	44,35%	18,14%	12,02%	2,23%	2,91%	2,18%	8,73%	6,97%	2,48%	100,00%

Source: own computation

The final results required for the complex evaluation of the CSR approach of the selected banks are obtained by using a distributive mode synthesis based on calculations of global weights reflecting organization scores in each sub-criterion. Detailed overview of local and global weights is given in Table 4. Česká spořitelna, a.s. (Organization A) is considered to be the most successful firm from the sample because it has achieved a little less than 56 %. Komerční banka, a.s. (Organization B) has scored 28 % while UniCreditbank Czech Republic, a.s. (Organization C) has accomplished about 16 %.

Tab. 4: Results of distributive mode synthesis

Sub-criteria	C11	C12	C13	C21	C22	C23	C31	C32	C33	Sum
Global $W_{i,j}$	0,4435	0,1814	0,1202	0,0223	0,0291	0,0218	0,0873	0,0697	0,0248	
A - local w	0,5396	0,6910	0,5584	0,1007	0,0852	0,1220	0,6144	0,6955	0,5695	
A - global w	0,2393	0,1254	0,0671	0,0022	0,0025	0,0027	0,0537	0,0485	0,0141	0,5554
B - local w	0,2970	0,0914	0,3196	0,6738	0,6442	0,5584	0,2684	0,2290	0,3331	
B - global w	0,1317	0,0166	0,0384	0,0150	0,0187	0,0122	0,0234	0,0160	0,0083	0,2802
C - local w	0,1634	0,2176	0,1220	0,2255	0,2706	0,3196	0,1172	0,0754	0,0974	
C - global w	0,0725	0,0395	0,0147	0,0050	0,0079	0,0070	0,0102	0,0053	0,0024	0,1644

$\Sigma = 1,0000$

Source: own computation

It is possible to carry out the CSR evaluation according to an ideal mode synthesis based on a determination of maximum values within organization global weights. Ideal scores

represent 100 % and remaining values are expressed as a relative part of each ideal. Results of this procedure that serves as another way of an interpretation are shown in Table 5. In all economic and social sub-criteria Česká spořitelna, a.s. (Organization A) is considered to be the ideal. Komerční banka, a.s. (Organization B; 49 %) achieves the best values in the whole environmental field that certainly affects a total score of the organization A (94 %). UniCreditbank Czech Republic, a.s. (Organization C; 28 %) accomplishes relatively good results in the environmental section but it should improve and extend a range of economic and social activities.

Tab. 5: Results of ideal mode synthesis

Sub-criteria	C11	C12	C13	C21	C22	C23	C31	C32	C33	Sum
Global W_{ij}	0,4435	0,1814	0,1202	0,0223	0,0291	0,0218	0,0873	0,0697	0,0248	
A	1,0000	1,0000	1,0000	0,1494	0,1323	0,2184	1,0000	1,0000	1,0000	
A recount	0,4435	0,1814	0,1202	0,0033	0,0038	0,0048	0,0873	0,0697	0,0248	0,9388
B	0,5503	0,1323	0,5724	1,0000	1,0000	1,0000	0,4368	0,3293	0,5848	
B recount	0,2441	0,0240	0,0688	0,0223	0,0291	0,0218	0,0382	0,0229	0,0145	0,4855
C	0,3029	0,3150	0,2184	0,3347	0,4200	0,5724	0,1908	0,1084	0,1710	
C recount	0,1343	0,0572	0,0262	0,0074	0,0122	0,0125	0,0167	0,0076	0,0042	0,2783

Source: own computation

Conclusion

The main goal of this paper is connected with the evaluation of CSR activities in the selected banking organizations by using the AHP method together with group decision making. The application of the AHP method in CSR evaluation topics is demonstrated on a sample consisted of the three organizations: Česká spořitelna, a.s. (Organization A), Komerční banka, a.s. (Organization B) and UniCreditbank Czech Republic, a.s. (Organization C). According to the results of the Czech Top 100 Most Admired Firms survey held in 2013 all of these organizations are considered to be an essential part of the Czech banking sector. Preferences of the criteria and the sub-criteria included in that multiple-criteria decision-making task are appraised by 5 experts, while the CSR performance of each banking organization is considered by the author's opinions based on information got from a content analysis of current internet presentations, CSR reports and other available publications and surveys. According to the distributive mode synthesis Česká spořitelna, a.s., representing a firm promoting a successful responsible approach, achieves the best results within the sample. Komerční banka, a.s. followed by UniCreditbank Czech Republic, a.s. takes a second place. According to the ideal mode synthesis Česká spořitelna, a.s. is considered to be the ideal in all

economic and social sub-criteria. Komerční banka, a.s. achieves the best values in the whole environmental field. These results should be also appropriately used for a subsequent determination of strengths and weaknesses of every CSR strategy of various organizations all over the world. A solution of multiple-criteria decision-making tasks based on hierarchical decompositions and paired comparisons should be a helpful managerial tool for decision making or benchmarking and bring reliable sources for suitable CSR evaluation procedures.

On the other hand, the AHP method is connected with a restraint based on a limited number of included options that result in a significant difficulty of paired comparisons. The fact that final results and a determination of ideal values are dependent on a choice of organizations included in a sample has to be taken into consideration. In the CSR evaluation field the Analytic Network Process method or DEMATEL working with dependence and feedback among all the elements involved in a decision could be used for a decision-making problem solution as well.

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