

Multidimensional Modelling of Social Performance Indicators in Processing Industry Companies in the Czech Republic

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Abstract—The contribution focuses on the identification of social performance indicators, i.e. the key ESG performance indicators. Successive stages and various statistical methods were applied to draft social indicators. The first stage included the method of selection of social indicators from the international sources of organizations and voluntary social tools; subsequently, a questionnaire was drawn up. Empirical analysis was undertaken in the years 2011-2012 in 79 companies involved in the processing per CZ-NACE. Univariate analysis of all variables preceded all stages of the selection of social indicators. T-test was used to test the relations among CSR and social indicators. Cluster analysis studied the file of social indicators in the subsequent stage of research; reduced social indicators to measure corporate performance were developed accordingly.

Keywords—Corporate Performance, Social Performance Indicators, Empirical Analysis, Univariate Analysis, T-test, Cluster Analysis, Processing Industry.

I. INTRODUCTION

THE environmental, social and corporate governance (ESG) performance together with Corporate Social Responsibility (CSR) and GRI – appear as essential at present. The overall company performance plays a key role in its corporate strategic policy and sustainability of success.

The creation of reliable methods of company performance measurement where concurrent acting of multiple factors is in play can be considered a prerequisite for success not only in decision making, but also with regard to corporate governance, comparison possibilities, development of healthy competition environment etc.

There is a need for creation of such indicators for evaluation

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and comparison of the integrated performance in companies, which would be informing with a reasonable explanatory ability about the ESG-performance of the company. KPI indicators must meet the basic criteria: effectiveness, uniformity, determinability of the indicator, comparability and unambiguous interpretation.

The objective research is to devise a method of selection of social performance indicators in the company level, which would form the part of ESG indicators. The application of proposed methodology of the selection of indicators is clearly illustrated by the example of social performance indicators.

The accomplishment of objective is divided into subsequent stages. The methodology defines individual stages of the selection of indicators including description of applied methods. Both financial and non-financial performance indicators are used to identify social indicators. Key Social Performance Indicators are formulated for companies operating in the processing industry per CZ-NACE with the application of statistical methods.

The research in the area of corporate performance evaluation and corporate sustainability reporting [1], [2], [3],[4],[5],[6] is very intensive in the Czech Republic and reflect the overall global world trends [7], [8], [9], [10]. Corporate successful sustainability [11], [12] that is the capacity of an organization to continue operating over a long period of time, depends on the sustainability of its stakeholder relationships.

Key performance indicators can facilitate the companies to plan and control their priorities. Moreover, the process of defining, selecting and measuring with non-financial indicators generates the added value by providing detailed insight into sustainability. Linking of objectives of non-financial indicators with top financial objectives of companies considerably contributes to the reaching of long-term sustainable performance, thus strengthening the company competitiveness.

II. SOCIAL PERFORMANCE

Social performance of companies represents a crucial component within the framework of ESG performance indicators. Both financial and non-financial indicators (so called soft indicators) are used to evaluate social performance.

As regards the social performance, it is necessary to determine by means of which standards, or approaches, the social indicators will be selected. Those, covering social area, include:

- Corporate Social Responsibility (CSR).
- Social Accountability 8000 (SA8000).
- ISO 26000.
- Socially Responsible Investment (SRI).

A trend, emphasizing social aspects, is represented by the concept introducing the social responsibility of companies (Corporate Social Responsibility-CSR) [13].

A. *Corporate Social Responsibility (CSR)*

A trend, emphasizing social aspects, is represented by the concept introducing the social responsibility of companies (Corporate Social Responsibility-CSR) [13].

Corporate social responsibility is a modern concept of business activity. CSR is the base of objectives of the strategy “Europe 2020” for intelligent and sustainable growth supporting incorporation, including the objective to achieve 75% employment rate [14].

The figures such as Mayo, Drucker or Keynes support CSR activities. So-called Petit-synthesis of their opinions says that “the industrial society faces serious human and social problems caused, above all, by the establishment of large corporations; managers must control activities of their companies in such a way so as to solve, or at least reduce, particular problems” [15].

Therefore, as regards social area, socially responsible companies adopt the principles of the systems of management such as OHSAS 18001, SA 8000 or Safe Company. They adhere to the principles formulated by the international organizations OECD (Organization for Economic Co-operation and Development), UN (United Nations) and ILO (International Labour Organization).

B. *Global Reporting Initiative (GRI)*

Standard Global Reporting Initiative (GRI 3.1) is recognized as the most important and world re-known concept for CSR reporting, also in connection with CSR Business Ethics.

The *Global Reporting Initiative (GRI)* is very important network-based organization that produces a comprehensive sustainability reporting framework that is widely used around the world. The GRI has pioneered the development of the world’s most widely used sustainability reporting Framework in 2000 and is committed to its continuous improvement and application worldwide. The GRI drives sustainability reporting by all organizations. It produces the world’s most comprehensive *Sustainability Reporting Framework* (GRI Framework) to enable a greater transparency of organizations.

In March 2011, the GRI released the G3.1 Guidelines [16], an update and completion of the G3 Guidelines from 2006. The GRI Framework, including the *Reporting Guidelines* [17], sets out the Principles and Indicators of reports and organizations can use these to measure and report their economic, environmental, and social performance.

C. *Social Responsibility and standard ISO 26000*

Direct relationship of social responsibility (SR) and standard ISO 26000 is given in relation with the reporting Guidance provided by GRI. ISO 26000 emphasizes the importance of reporting on socially responsible performance for stakeholders (e.g. employees, local communities, investors and regulators) in harmony with economic, environmental and social performance [18]. Moreover, GRI utilizes also qualitative indicators in cases when the social themes cannot be easily quantified. ISO 26000, GRI G3 and G3.1 have a similar scope of themes in the social area.

D. *Socially Responsible Investment (SRI)*

Socially Responsible Investment combines financial performance and social, environmental and ethical factors. Many companies have also begun asking how they can evolve their communications on environmental, social and governance factors to these mainstream investors [19].

Several methods can be applied to measure social efficiency. E.g., CSR reports, reports on sustainable development, either separately or as the part of annual reports, can be effectively used. ESG indicators in Financial reporting, Sustainable reporting and Integrated reporting can provide relevant information, and even over time [20]-[21].

III. EMPIRICAL ANALYSIS

The data serving for the evaluation of sustainable performance of companies are the indicators specified in the Global Reporting Initiative (G3.1, 2011), UN Global Compact, OECD, UNCTAD, CFA Institute, EFFAS-DVFA, IFAC, UNEP FI, Corporate EEA, EUROSTAT, CZO, ILO, etc. [22]-[26]. The empirical analysis was conducted on the basis of a questionnaire investigation. The questionnaire “COMPANY PERFORMANCE: ENVIRONMENTAL, SOCIAL, CORPORATE GOVERNANCE AND ECONOMIC” was designed in harmony with acquired theoretical knowledge from the international sources, delimited borders of solved problem and factual objectives in such a way so as acquired outputs could contribute to the specification of performance indicators for the processing industry per CZ-NACE.

A database of companies was created; subsequently, following companies were selected and personally addressed according to the legal form of their business: 42 joint stock companies, 35 limited liability companies, 1 association and 1 state-owned enterprise active in the processing industry, i.e. totally 79 companies with the number of employees over 250

according to the EU criteria. Manufacturing companies were selected intentionally on the grounds of comparability of data; moreover, the companies had wide sphere of activity not only in the social, corporate governance, economic sphere, but also environmental as regards the relation to the voluntary tools of management. Empirical analysis was mainly focused on the manufacturing companies in Table 1.

IV. METHODOLOGY RESEARCH

The methodology of identification of social indicators passed through different subsequent stages. The first stage was represented by the empirical analysis of the social area on the basis of the questionnaire with the focus on processing industry companies per CZ-NACE. The data, analysing the

Table1 Manufacturing companies according to Classification of Economic Activities (CZ-NACE) and voluntary management tools

Classification of Economic Activities (CZ-NACE)		Frequency	Percent	Use voluntary tools manufacturing companies			
				CSR	ČSN OHSAS 18000	ISO 9000	ISO 14000
C *	10-11 Manufacture of food	8	10.3 %	10.0 %	7.9 %	8.6%	2.3 %
	13-16 Manufacture of textile and leather	9	11.5 %	10.0 %	7.9 %	12.9%	9.3 %
	20-23 Manufacture of chemical	8	10.3 %	15.0 %	13.2 %	10.0%	14.0 %
	24-25 Foundry production	11	14.1 %	10.0 %	13.1 %	14.3%	16.1 %
	26-33 Manufacture of electrical engineering, medical products	30	38.5 %	40.0 %	42.1 %	40.0%	44.2 %
(D+E)*	35-38 Electricity, gas, water and waste processing	12	15.4 %	15.0 %	15.8 %	14.2%	14.0 %
Total		78	100.0 %				
System		1					
Total		79					

*C Manufacturing

* D+E Water supply. Waste management and Remediation Activities

(Source: own processing of research)

From the ownership point of view, from participating 79 companies 44 companies (55.7 %) were exclusively in the domestic ownership, the rest 35 (44.3 %) were branches of multinational corporations and companies with foreign investor.

The objective methods are the best appropriate methods of selection of social indicators, e.g. on the basis of statistical analyses. They provide results based on clear algorithms, coming out exclusively from the values of indicators as such. Nevertheless, factually- logical view on monitored indicators is eliminated. Subjective indicators come out primarily from the responses of respondents and their reflections of explored issue. Selection of indicators for corporate performance measurement can be considered as the combination of objective and subjective approaches.

Mentioned empirical analysis focused on the determination of key performance social indicators for the companies involved in the processing industry per CZ-NACE, another condition was the availability of such indicator. 19 indicators were selected to set up initial database. The data file of indicators from the international sources is very broad and some indicators provide similar evidence capability or are minor. Selection of relevant indicators with the application of statistical methods was necessary. Progress from simple descriptive statistics to univariate and multivariate analyses is necessary for the evaluation.

All calculations were analysed by the program SPSS for Windows, ver. 20, with the combination of various statistical methods, descriptive statistics and cluster analysis [27].

social indicators, were contained in the international sources Global Reporting Initiative [16], ISO 26 000 [18], International Federation of Accountants [23] and the Czech Statistical Office [28] in Table 2.

Table 2 Confrontation of indicators GRI, CSR, ISO 26 000 and IFAC

Global Reporting Initiative (GRI)	ISO 26000 Core Social Responsibility Subjects & Themes	International Federation of Accountants
Labour Practices and Decent Work (LA) Aspect: Employment Aspect: Labour Relations Aspect: Occupational Health and Safety Aspect: Training and Education Aspect: Diversity and Equal Opportunity Human Rights (HR) Aspect: Investment and Procurement Practices Aspect: Non-Discrimination Aspect: Child Labour Aspect: Forced and Compulsory Labour Society (SO) Aspect: Community Aspect: Corruption Aspect: Public Policy Aspect: Compliance with Laws and Regulations Product Responsibility (PR) Aspect: Customer Health and Safety Aspect: Products and Service Labelling Aspect: Marketing Communications Aspect: Compliance with Laws and Regulations	Social Category (includes Human Rights, Labour, Product Responsibility and Society) Organizational governance Labour Practices Fundamental principles and rights at Work Organizational governance Human Rights Organizational governance Fair Operating Practices Community involvement and development Organizational governance Fair Operating Practices Consumer Issues	Workplace health and safety Human capital development: training and qualification Human capital management: staff turnover, maturity and diversity, absenteeism

(Source: own processing of research)

On the basis of the questionnaire investigation a selected sample of companies was put the question: “Which social indicators do you monitor?” Respondents were asked to indicate their responses on the grounds of the four point Likert - type scale: 1 = not, 2 = rather not, 3 = rather yes, 4 = yes and 5 = do not know.

The empirical analysis revealed that monitoring of the indicators “**Labour Practices and Decent Work (LA)**“ is important to the companies: Number of employees 96.2 %, Number of occupational accidents 96.2 %, Total staff number and Staff fluctuation rate 88.2 %, Expenditures on education and training 84.8 %, Working relations 81.2 %, Occupational diseases, number of deaths 78.2 %. Less important are the Equivalent opportunities 56.0 %.

The response oscillates maximally in the area of “**Human Rights (HR)**”: nevertheless, the companies monitor the indicator of Human rights (forced and obligatory work) 53.4 %, Discrimination 36.4 % and Freedom of associations and collective bargaining 47.9 %.

Important social indicators “**Product responsibility (PR)**”: Safety and quality of products 96.2 %, Identification of products and services 83.5 %, Marketing communication 76.6 % and Safety and protection of health of customers 71.8 %.

Other social indicators in the category “**Society (SO)**” indicated that companies stressed the Observance of laws and regulations with products 94.9 %. Involvement in politics and Child labour are minor indicators.

Descriptive statistics was prepared based on the fact that certain specifics of the variables influence the result of methods of subsequent stages, and they can be revealed already in the descriptive statistics of the individual indicators. Mean, standard deviation and variance and coefficient of variation were calculated. Descriptive statistics contains 19 variable social indicators in Table 3.

Table 3 Descriptive statistics of social indicators

No	Variables	Mean	Std. Deviation	Coefficient of Variation (%)
14a	Number of employees	3.95	0.273	6.911
14b	Staff fluctuation rate	3.87	0.377	9.742
14c	Labour relations	3.73	0.662	17.748
14d	Number of occupational accidents	3.95	0.273	6.911
14e	Occupational diseases, number of deaths	3.63	0.791	21.791
14f	Expenditures on education and training	3.78	0.57	15.079
14g	Equivalent opportunities	3.15	1.099	34.889
14h	Human rights	3.21	1.027	31.994
14i	Discrimination	2.91	1.078	37.045
14p	Safety and protection of health of customers	3.59	0.763	21.253
14q	Identification of products and services	3.66	0.861	23.525
14r	Marketing communication	3.58	0.848	23.687
14s	Observance of laws and regulations with products	3.91	0.429	10.972
14t	Safety and quality of products	3.92	0.417	10.638
14j	Freedom of associations and collective bargaining	3.4	1.123	36.941
14l	Child labour	2.32	1.363	58.75
14m	Allowances to municipalities	2.57	1.315	51.167
14n	Community	2.45	1.205	49.184
14o	Public involvement in politics	1.74	1.035	59.483

(Source: own processing of research)

The relationship between social aspects of corporate social responsibility (CSR) and 19 social indicators have been tested upon statistical significance (T-test) with Levene's Test for Equality of Variances. Statistically significant difference can be described only in the case of social approaches to socially responsible behaviour (CSR). If the company is committed to CSR, then it states more areas to which it applies in the framework of corporate social responsibility (statistically significant, $t(46) = 4.63, P < 0.001$, the strength of the effect is $r = 0.57$). However, this distinction is going to non-significant level at \sum Monitoring of social indicators, as stated by the author [29]. It is possible that the selected items in the sum of monitored social indicators show in an imperfect way elements of social responsibility; this can be detected by use of the factor analysis.

On the basis of the factor analysis have been identified the social area factors in Table 4.

Table 4 Testing of the statistical significance (T-Test) of the factors in the social field

	Factor 2 Human rights		Factor 4 Product Responsibility		Factor 3 Labor Practices and Decent Work		Factor 1 Society	
	Is used	Is not in use	Is used	Is not in use	Is used	Is not in use	Is used	Is not in use
N	14	41	14	41	14	41	14	41
Mean	0.329	-0.1052	0.0569	-0.0136	0.3181	0.0374	0.581	-0.1906
Std. Dev.	0.6297	1.1623	0.777	1.0835	1.3372	0.9561	0.9499	1.0013
Std. Error Mean	0.1683	0.1815	0.2076	0.1692	0.3573	0.1493	0.2538	0.1563
Variables	Levene's Test for Equality of Variances		T-test for Equality of Means					
	F	P-value	t	df	P-value (2-tail.)	Mean Difference	Std. Error Difference	
Factor 2 Human rights	EQVA*	4.621	0.036	1.328	53	0.19	0.434	0.3271
	EQVNA*			1.754	42.2	0.087	0.434	0.2475
Factor 4 Product Responsibility	EQVA*	2.378	0.129	0.224	53	0.823	0.070	0.3147
	EQVNA*			0.264	31.5	0.794	0.071	0.2678
Factor 3 Labor Practices and Decent Work	EQVA*	0.96	0.332	-1.081	53	0.284	-0.356	0.3288
	EQVNA*			-0.918	17.7	0.371	-0.356	0.3873
Factor 1 Society	EQVA*	0.096	0.758	2.521	53	0.015	0.772	0.3061
	EQVNA*			2.588	23.6	0.016	0.772	0.2981

* Equal variances assumed ** Equal variances not assumed

(Source: own processing of res)

„**Factor 3** Labour Practices and Decent Work “and „**Factor 4** Products Responsibility“ can be understood also outside the context of corporate social responsibility. To the different quality of the described factors, due to the CSR, also points out the comparison of average individual factors according to the relationship of the company to CSR.

There was confirmed different weight of individual factors for the CSR concept. The values of „**Factor 3** Labour Practices and Decent Work “ and „**Factor 4** Products Responsibility“ are independent of whether or not the

company is committed to the CSR. „**Factor 1** Society“ is statistically significantly changed when the company is committed to the CSR ($t(53) = 2.52, P < 0.05$, the strength of the effect $r = 0.33$). Just a little bit beyond the statistical significance is then „**Factor 2** Human rights“ (statistically non-significant ($t(42) = 1.75, P > 0.05$, the strength of the effect $r = 0.26$).

On the basis of these findings, there was further designed CSR Index, that will contain only the items „**Factor 1** Society“ and „**Factor 2** Human rights“ in Table 5.

Table 5 Testing of statistical significance (T-Test) of the CSR reporting

Characteristics	CSR	N	Mean	Std. Deviation	Std. Error Mean
CSR index (Factor 1 Society and Factor 2 Human rights)	Is used	20	6.30	2.473	0.553
	Is not in use	59	4.86	2.410	0.314
Variables				CSR index (Factor 1 Society and Factor 2 Human rights)	
				EQVA*	EQVNA**
Levene's Test for Equality of Variances	<i>F</i>			0.006	
	<i>P</i> -value			0.940	
T-test for Equality of Means	<i>t</i>			2.287	2.258
	<i>df</i>			77	32.114
	<i>P</i> -value. (2-tail.)			0.025	0.031
	Mean Difference			1.436	1.436
	Std. Error Difference			0.628	0.636

* Equal variances assumed ** Equal variances not assumed (Source: own processing of research)

The resulting „CSR Index“ seems to be valid, because the result of comparison of firms committed/non-committed to the CSR on the newly created „CSR Index“, composed solely of „**Factor 1** Society “ and „**Factor 2** Human rights“, is statistically significant ($t(77) = 2.287, P < 0.05$, the strength of the effect $r = 0.25$).

The relation among CSR reporting, monitored social indicators and CSR index („**Factor 1** Society“ and „**Factor 2** Human rights“) was also subject of testing for statistical significance (T-Test).

The relationship of CSR is clearly bound with the voluntary CSR reporting. Companies that issue CSR messages are accessing to theirs social responsibility in more areas (statistically significant $t(77) = 3.53, P < 0.001$, the strength of the effect $r = 0.37$) and also monitor more CSR indicators (Index of net CSR „**Factor 1** Society“ and „**Factor 2** Human rights“) (statistically significant $t(77) = 2.14, P < 0.05$ the strength of the effect $r = 0.24$).

A. Cluster Analysis

In the second phase of the research were the original 19 social indicators further subject to the cluster analysis, regardless to the results of the previous statistical survey. The aim was to identify the similarities between the variables and, where appropriate separated values and different from others, which could bring in a comprehensive evaluation a specific information.

Cluster analysis is a more-dimensional statistical method which is used for classification of the objects. For the Cluster analysis was used the hierarchical method called Ward method. For the method of distances between variables was chosen Euclidean distance [29]-[33].

Cluster analysis was performed on standardized values. The dendrogram shows the gradual process of clustering in Fig. 1.

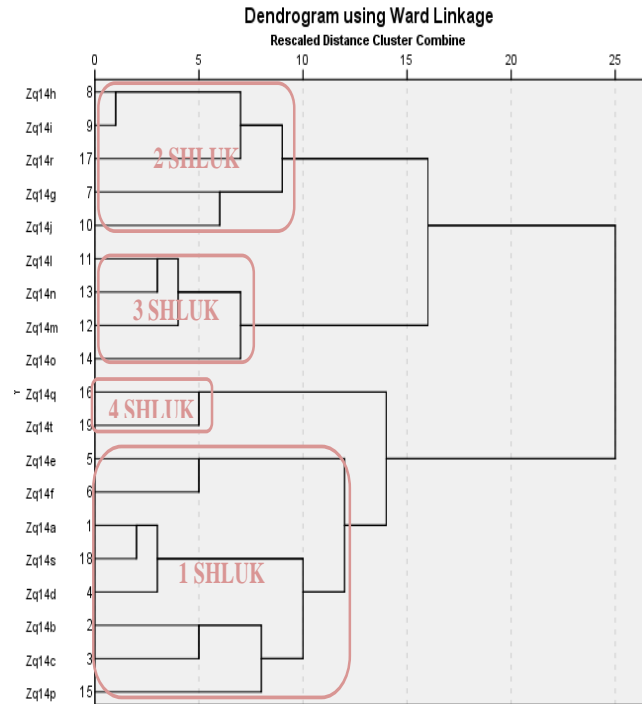


Fig. 1 The results of the cluster analysis for the variable social indicators

Note: Dendrogram-Ward's method

The results of the cluster analysis according to the Ward method suggest that the most similar are the social indicators in: **Ist cluster** (14b. Staff fluctuation rate, 14c. Labour relations, 14e. Occupational disease and the number of deaths, 14f. Expenditures on education and training, 14p. Safety and protection of health of customers, 14a. Number of employees, 14d. Number of occupational accidents and 14s. Observance of laws and regulations with products). **IInd cluster** (14g. Equivalent opportunities, 14h. Human rights, 14i. Discrimination, 14i. Freedom of associations and collective bargaining and 14r. Marketing communication). **IIIrd cluster** (14m. Allowances to municipalities, 14n. Community, 14l. Child labour, 14o. Public involvement in politics. **IVth cluster** (14q. Identification of products and services 14t. Safety and products quality).

B. Results and Discussion

The results of empirical analysis rely on descriptive statistics, furthermore on testing of the statistical significance of social factors (T-Test) according to Levene's Test for

Equality of Variances of their mutual relationship to the CSR reporting.

Selection of significant indicators proceeded from the input database, analysed and verified by basic descriptive statistics. The objective of descriptive statistics working with all initial input indicators, obtained by the analysis of available expert sources and empirical research, was the identification of particularities of variables, having any impact on the results of other methods of subsequent research stages.

Selection of significant indicators for reviewed industry from the input database was the aim. The purpose was not to substitute identified database, but to establish an alternative file of appropriate variables. The objective of further data processing was the reduction of original broad file of indicators, namely by expert analysis and subsequent decision made by the team of authors, representing the input for subsequent application of multi-dimensional statistical methods.

From the original 19 social indicators were selected on the basis of statistical methods 8 social indicators for the companies in the manufacturing industry in Table 6.

The proposed social indicators should serve for the evaluation of ESG-performance and they should meet some basic requirements: the clarity, simplicity, real verification of data for its determination, taking into account the comprehensive problem and representativeness. The indicators should include the essential and characteristics features of ESG-performance.

V. CONCLUSION

The proposed social performance indicators should help companies to demonstrate a progress towards the objectives of sustainability. The use of key performance indicators, in a given corporate context can be demanding. Before the company shall decide for the key performance indicators, it is important to understand how they can be best used and include them in the internal management and to support sustainable reporting. Managers must contemplate how to present the key performance indicators in their internal and external reporting.

Table 6 Social performance indicators for the companies in manufacturing industry

Measurement Area	Key Performance Indicators (KPI)	Measure and (Unit)
<i>Labor Practices and Decent Work (LA)</i>	The rate of staff turnover (Indicator LA2 in GRI)	Total number of terminate the employment in given to period (year) x 100/ Total number of employees in given to period (year), (%)
	Expenditure on education and training (Indicator LA10, L11, L12 in GRI)	Total number of training hours per year per employee x 100/Total number of employees in given to period (year) (%) Costs in education x100 /Total personal , (%)
	Occupational illnesses Number of deaths (Indicator LA7 in GRI)	Total number Occupational Disease Rate x 100/ Total number of employees in given to period (year), (%) Total number of deaths x 100/ Total number of employees in given to period (year), (%)
	Equivalent opportunities (Indicator LA13, LA14 in GRI)	Total number of women x 100/ Total number of employees in given to period (year), (%)
<i>Product Responsibility (PR)</i>	Labelling of products and services (Indicator PR3, PR4, PR5 in GRI)	Total number of reclamation x 100/Total number of products,(%)
	Marketing communication (%) (Indicator PR6, PR7 in GRI)	Total number of consumers on year-end – new arrivals within a year x 100/number consumers at the beginning year, (%) Elements for access to web pages.
<i>Society (SO)</i>	Community (Indicator SO1 in GRI)	Corporate social investment, „CSI“ Total cash value of donations x 100/turnover, (%)
<i>Human rights (HR)</i>	Discrimination (Indicator HR4 in GRI)	Total number of discrimination cases x 100/ Total number of employees in given to period (year), (%)

(Source: own processing of research)

Factors which have been identified with research could be linked to the following four indicators, as follows: Labour Practices and Decent Work (LA), Human Rights (HR), Product Responsibility (PR) and Society (SO). This structure is also consistent with the Global Reporting Initiative GRI (G 3.1, 2011).

During the performance evaluation using indicators is necessary to track a wide range of indicators and to carry out analyses from the point of the social aspects. These aspects and the financial and non-financial indicators represent a wide data base.

Responsibility for performance against the strategic objectives, including sustainable performance, requires understanding the causal relationship between the various activities and their impact on the financial and non-financial performance.

Evaluation and measurement of performance is usually the feature of most successful companies.

The paper presents the results of cluster analysis of selected questions (no. 14) included in the research questionnaire, connected with the identification of social indicators.

The reduced database of 8 social indicators was designed on the basis of the cluster analysis. Carried-out analysis showed 4 clusters (see Fig. 1), characterizing four areas of indicators – Labour Practices and Decent Work (LA), Human Rights (HR), Product Responsibility (PR) and Society (SO). This structure is also consistent with the Global Reporting Initiative GRI [16].

The result (Table 3) indicates the issue of consideration of relevancy of the implementation of indicators with variance coefficient higher than 40%. These are indicators 14l. Child labour (58,75 %), which has high variability, is not included because it is prohibited by legislation of the laws of the Czech Republic, 14m. Contributions to the villages (51,17 %), 14n. Community (49,18 %) and 14o. Public involvement in politics (59,48 %).

The company itself should select its key social indicators on the basis of their significance and from the point of its strategy. The application of key performance indicators in a particular organizational context can be demanding. The understanding of their application and most appropriate implementation into the internal management shall be necessary prior to company's decision regarding the measures of key performance indicators.

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REFERENCES

- [1] A.Kocmanová, M.Dočekalová, "Corporate Sustainability: Environmental, Social and Corporate Performance", *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, vol. LIX, no.7, pp. 203-208, December 2011.
- [2] A.Kocmanová, M. Dohnal, T. Meluzin, "Qualitative simple equation less models as simple integrators of vague sustainability knowledge items", *Transformations in Business & Economics*, vol.11, no.3, pp. 187-196, December 2011.
- [3] A.Kocmanová, M. Dočekalová, "Construction of the economic indicators of performance in relation to environmental, social and corporate governance (ESG) factors", *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, vol. LX, no. 4, pp.141-149, July 2012.
- [4] J.Hřebíček, J. Soukopová, M.Štencl, O.Trenz, "Corporate Key Performance Indicators for Environmental Management and Reporting," *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, vol. LX, no.3, pp. 99-108, February 2011.
- [5] J.Hřebíček, J. Soukopová, M.Štencl, O.Trenz, "Corporate Performance Evaluation and Reporting", in Proc. *International Conference on Environment, Economics, Energy, Devices, Systems, Communications, Computers, Pure and Applied Mathematics*. Wisconsin, USA, WSEAS, 2011, pp. 338-343.
- [6] Z.Chvátalová, A.Kocmanová, M.Dočekalová, "Corporate Sustainability Reporting and Measuring Corporate Performance," in Proc.

- Environmental Software Systems. Frameworks of eEnvironment. 9th IFIP WG 5.11 International Symposium*, ISESS 2011, Heidelberg : Springer, 2011, pp. 398-406.
- [7] A.Bassen, A.M.Kovacs, "Environmental, Social and Governance Key Performance Indicators from a Capital Market Perspective," *Zeitschrift für Wirtschafts und Unternehmensethik*, vol. 9, pp. 182-192, February 2008.
- [8] S.Schaltegger, M.Wagner, "Integrative Management of Sustainability Performance, Measurement and Reporting," *International Journal of Accounting, Auditing and Performance Evaluation*, vol. 3, pp. 1-19, January 2006.
- [9] S.Schaltegger, M.Wagner, "Managing Sustainability Performance Measurement and Reporting in an Integrated Manner, Sustainability Accounting as the Link between the Sustainability Balanced Scorecard and Sustainability Reporting", Dordrecht: Springer, 2006. p.564.
- [10] V.Stefan, M. Duica, M. Coman, V. Radu, "Enterprise Performance Management with Business Intelligence Solution," in Proc. *4th WSEAS International Conference on BUSINESS ADMINISTRATION (ICBA '10)*, Wisconsin, USA, WSEAS, 2010, pp. 244-250.
- [11] P.Taticchi, F. Tonelli, L. Cagnazzo, "Development of a Performance Measurement System: Case Study of an Italian SME," in Proc. *EACTIVITIES' 09/ISP'09, 8th WSEAS International Conference on EIssue Activities and information security and privacy*, Wisconsin, USA, WSEAS, 2009, pp. 42-47.
- [12] A.Kocmanová, P.Němeček, "Economic, Environmental and Social Issues and Corporate Governance in Relation to Measurement of Company Performance," in Proc. *9th International Conference Liberec Economic Forum 2009*. Liberec, Technical University of Liberec, 2009, pp. 177-186.
- [13] A.B.Carroll, "Corporate Social Responsibility -Evolution of a Definitional Construct". *In Business and Society*, vol. 38, no. 3, 1999, pp. 268-295.
- [14] P.Franc, J.Nezhyba, C.Heydenreich, "When is taking social responsibility never", *Ecological law servicing*, Brno, 2006, pp.72.
- [15] L.Hassel. (2011). Ri Digest: How is ESG integration effective? [Online]. Available: <http://www.sirp.se/web/page.aspx?refid=62&newsid=111024&hlt=RI+Digest>
- [16] G3 Guidelines website on Globalreporting. (2006). [Online]. Available: <https://www.globalreporting.org/reporting/latest-guidelines/g3-guidelines/Pages/default.aspx>
- [17] G3.1 Guidelines on Globalreporting. (2011). [Online]. Available: <https://www.globalreporting.org/reporting/latest-guidelines/g3-1-guidelines/Pages/default.aspx>
- [18] GRI and ISO 26000. (2011). How to use the GRI Guidelines in conjunction with ISO 26000. [Online]. Available: http://www.globalreporting.org/NR/rdonlyres/4A15F3C6-13D1-4AB4-9D5D-C93C38E56A3D/5468/ISOGRIRReport_FINAL.pdf
- [19] K.E.Aupperle, A.B. Carroll, J.D. Hatfield, "An empirical examination of the relationship between corporate social responsibility and profitability", *Academy of Management Journal*, vol.28, no.2, 1985, pp.446-463.
- [20] A.Kocmanová, I.Šimberová, P.Němeček, "Qualitative relationships between the environmental, social and governance (ESG) performance indicators for supporting the decision-making, in Proc. *the 15th World Multi-Conference on Systemics, Cybernetics and Informatics*. 2012. IFSR ,Orlando, USA: WMSCI 2012, p. 94-99.
- [21] J.Strouhal, L. Mullerova, Z. Cardova, M. Pasekova, " National and International Financial Reporting Rules: Testing the Compatibility of Czech Reporting from the SMEs Perspective", *WSEAS Transactions on Business and Economics*, vol. 6, no. 12, 2009, pp.620-629.
- [22] BSR.(2011). ESG in the Mainstream: The Role for Companies and Investors in Environmental, Social, and Governance Integration. [Online]. Available: <<http://www.bsr.org>>.
- [23] IFAC. (2011). Investor Demand for Environmental, Social and Governance Disclosures. [Online]. Available: <<http://www.ifac.org/publications-resources/investor-demand-environmental-social-and-governance-disclosures>>.
- [24] CA. (2011). Environmental, Social and Governance (ESG) Issues in Institutional Investor Decision Making. [Online], Available: <<http://www.cica.ca/publications/list-of-publications/manual/item41881.pdf>>.
- [25] H.Garz, F.Schnella, R. Frank. (2012). KPIs for ESG. A Guideline for the Integration of ESG into Financial Analysis and Corporate Validation. Frankfurt, DVFA/EFFAS. [Online]. Available: http://www.dvfa.de/files/die_dvfa/kommissionen/non_financials/application/pdf/KPIs_ESG_FINAL.pdf.
- [26] CFA Institute.(2008). Environmental, Social, and Governance Factors at Listed Companies: A Manual for Investors. [Online]. Available: <<http://www.cfapubs.org/toc/ccb/2008/2008/2>>.

- [27] A.Field, “*Discovering statistics using SPSS*”, London: SAGE, 2009, pp.856.
- [28] Czech Statistical Office. (2012). [Online].Available: <http://www.czso.cz/>.
- [29] M.Meloun, J. Militký, “*Compendium statistical data processing: method and problem solution including CD*”, Praha: Academia, 2002, pp.764.
- [30] P.Hebák. J. Hustopecký, “*Multidimensional statistical methods with applications*”, Praha: SNTL, 1987, pp.202.
- [31] L.Kuprová, J. Kamenický, “ Multi-factor analysis position limits Czech Republic in years 2000-2004”, *Statistika*, vol. 1, no.4, pp. 303-315.
- [32] P. Petr, J.Krupka, R. Provaznikova, “Multidimensional Modeling of Cohesion Regions”, *International Journal of Mathematical Models and Methods in Applied Sciences*, vol.2,no.3.pp.150-158.
- [33] M.Z.Nuawi, F.Lamin, S. Abdullah, M.J.M. Nor, A. Arifin, “ Cluster Analysis using I-kaz Coefficient to Assist Machining Monitoring Process” *International Journal of Mathematical Models and Methods in Applied Sciences*, vol.5,no.1.pp.439-446.

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