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ENVIRONMENTAL MANAGEMENT SYSTEMS: AN EFFECTIVE TOOL OF CORPORATE SUSTAINABILITY[*]

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Abstract. The paper addresses corporate environmental policy concentrating on the current relationship of business activities towards environmental management in the Czech Republic. The pressure to adopt environmentally responsible behaviors motivates companies to initiate ecological practices, such as environmental and energy management systems, green balanced scorecard or green supply chain management. The efforts beyond the legislative requirements that are justified by potential cost reduction together with need for risk-based thinking, support investments into sustainable projects. This paper attempts to provide an in-depth view of the current enterprise practices and behavior in environmental management within the selected industrial sector in the Czech Republic region. Based on the mix of qualitative and quantitative approaches, the authors carried out structured in-depth interviews combined with a questionnaire survey with the aim to analyse the Czech environmental policy practices. A sample of 247 medium and large-sized Czech manufacturing companies was used for the survey. Three levels of environmental management system were identified: legal, basic and mature. The findings underscore the critical role of the management strategy approach and stakeholder requirements´ monitoring. The research revealed that an important atribute in environmental activies in business area is the ownership structure. The foreign ownership has positive impact on the level of environmental management system adoption. The study makes practical contribution in that it explains the mature environmental management system concept and shows a possible path in the environmental behavior to companies not meeting the requirements of the mature system. The authors highlight also the need for awareness raising of business owners and top management to increase their interest in being more involved in environmental activities.

Keywords: mature environmental management system; corporate environmental policy; environmental behaviour; sustainability concept

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JEL Classifications: Q56, F64, O13, P4

1. Introduction

Organizations are pressed to initiate ecological practices, for instance environmental or energy management systems (EMS, EnMS), green balanced scorecard and green supply chain management. Furthermore, legislative requirements, cost reduction pressure and a need for risk-based thinking push forward the motivation to invest in sustainable projects (Buganová & Hudáková, 2015). Social changes such as urbanization, sharing and circulation economy influence business activities, reflecting a growing public pressure and in the overall image of the company.

The basic sustainability concept of the tripple bottom line (3BL) encompasses three pillars of sustainability: economic, social and environmental. Environmental responsibility in the form of environmentally friendly and more efficient processes enables thus potential differentiation for businesses. The product and process innovations allow for additional benefits, including cost savings. From this point of view, the environmental responsibility should be seen as a competitive advantage and not only as an inconvenient cost (Porter & van der Linde, 1995; Moumen, El Idrissi, Tvaronavičienė, & Lahrach, 2019; Dabyltayeva & Rakhymzhan, 2019).

European countries have been recently intensively leading ecological policy initiatives and related regulatory reforms. Environmental rules and regulations in these countries are among the tightest in the world. Forced by internal or external factors, companies adopt also voluntary systems such as ISO certification (ISO 14001, ISO 50 001) or the EMAS scheme. As organizations are responsible for their environmental impacts, they must declare consistency with this legislative framework. Researchers need to examine environmental behavior within this existing regulatory framework and the Czech Republic is not an exception.

The authors Figueres et al. (2017) identified six sectors to cope with sustainable development, claiming that the fossil-free economy is already profitable. These sectors include energy, infrastructure, transport, land, industry, and finance. More attention should be given to the industrial sector with the most carbon-intensive industries, which are emitting more than one-fifth of the global CO^2, not reflecting their heat and electricity consumption. However, as Castro et al. claimed, industrial companies are bound by high legally and socially environmental pressures (Martín-de Castro, Amores-Salvadó, Navas-López, & Balarezo-Nuñez, 2017). However, they found out that most of the firms with EMS certification fail to effectively implement EMS practices inside the company. Zobel et al. came to the conclusion that the possible ISO 14001 certifications are valid as market signaling, presenting them externally to stakeholders. The phenomenon called symbolic environmental commitment, related to greenwashing practices, is not rare (Zobel, 2013).

Organizations need to reflect the sustainable actions even in the energy field specifically. Bearing in mind the instant innovations in renewables and the pressures to adopt ecological behaviors, organizations are pushed to make changes in the energy management. Renewable energy sources represent an important part of greenhouse gas reduction solution, approved by the EU climate initiative (20% reduction till 2020). From this point of view, the potential for renewable energy sources, pro-active environmental and energy behavior in the regional industry seem to be still lacking behind current trends in the developed countries.

In this context, small and medium enterprises (SMEs) play an important role in most economies. Recent research has focused on their impacts on the natural environment and on the wide range of the environmental strategies, the regulatory compliance, the proactive pollution prevention and the environmental leadership. A positive

competitive advantage was found to be related with the implementation of a green business strategy (Leonidou, Christodoulides, Kyrgidou, & Palihawadana, 2017).

This article focuses on environmental behavior of middle and large Czech industrial companies. The main goal of the research is the identification of different environmental behaviors of companies. Based on a pre-research, the authors revealed the possible existence of different levels of EMSs in manufacturing companies. The most important factors were examined and the current relationship of business activities towards environmental and energy management analyzed. Reasons for ecological behavior of companies were investigated: environmental responsibility as a potential differentiation between businesses and innovations, allowing for additional benefits including cost savings.

2. Theoretical backround

An increasing amount of literature, more or less related to the sustainability and environmental issues, has been published, analyzing the attitudes of companies from different perspectives. Already in 1987, the Our Common Future report (called the Brundtland Report), released by the United Nations World Commission on Environment and Development, outlined the sustainable development path (Brundtland et al., 1987). Afterwards, the essential sustainability concept of the triple bottom line (3BL) was introduced on the company level by (Elkington & Rowlands, 1999), and it was based on three pillars: economic, social and environmental sustainability. A similarity might be found also in the concept of corporate social responsibility (CSR). Lately, authors Kramer and Porter tried to broaden this concept by introducing the creating shared value, which should supersede the CSR framework (Kramer & Porter, 2011). However, the consistent definition of sustainability, together with the interdisciplinary approach and the system perspectives belongs to current environmental research challenges (Little, Hester, & Carey, 2016).

According to the natural resource-based view of the firm (Hart, 1995; Hart & Dowell, 2010), company resources represent the competitive advantage which cannot be easily copied by competitors of that firm. Moreover, the natural resource-based theory claims that close competitors differ based on the character of their resources and capabilities, including environmental performance (Barney, Wright, & Ketchen, 2001; Russo & Fouts, 1997). Some longitudinal empirical analyses reveal changes in environmental strategies and management attitudes towards company resources (Rhee & Yol Lee, 2007). Environmental innovations play a crucial role due to the positive effect on competitive advantage. Asking themselves the question "Does it pay to be eco?", authors Hojnik et al. concluded that introduction of eco-innovation might lead to positive and significant benefits (Hojnik & Ruzzier, 2017), Dixon-fowler et al. advocated the positive relationship between corporate sustainability practices and corporate financial performance (Dixon-fowler, Slater, Johnson, Ellstrand, & Romi, 2013) and RES are considered to be clean energy sources that minimize negative environmental impacts with positive future economic and social needs (Panwar, Kaushik, & Kothari, 2011). Moreover, RES belong to the core trends in the innovative product design and they have become part of sustainable manufacturing processes (Jawahir, Rouch, Dillon, Holloway, & Hall, 2007). However, researchers have been analyzing diffusion and implementation of RES technologies with not very optimistic results. Despite public efforts and governmental support, it has recently been a very slow process. In this context, the business model innovation is still an area that needs further investigation (Negro, Alkemade, & Hekkert, 2012). The reference to (Shin, Ellinger, Nolan, DeCoster, & Lane, 2016) shows a specific association between renewable energy source (RES) utilization and corporate performance, confirming the superior financial performance of companies that utilize RES in comparison to their industry competitors. On the contrary, some empirical studies show mixed results not fully supporting environmental management effect on the financial performance. A study by (Hitchens, Thankappan, Trainor, Clausen, & De Marchi, 2005) showed that companies with an average financial performance were comparable to high-performing competitors in environmental initiatives.

Based on Field et al., three groups of instruments for sustainable environmental resources management exist: direct regulations (command and control), market-based or economic duties such as taxes, subsidies, tradable permits and environmental liability, and voluntary (soft) instruments, which support proactive attitudes towards the environment (Field & Field, 2013). Voluntary approaches, together with command and control mechanisms, have been increasing, as they were promoted by governments, and having additional synergy effects on the environmental performance of facilities (Arimura, Hibiki, & Katayama, 2008).

The main voluntary tools influencing the company environmental behavior is the environmental management system (EMS) which aim is to develop, implement, manage, coordinate and monitor the environmental activities of organizations (Daddi, De Giacomo, Frey, & Iraldo, 2017; Melnyk, Sroufe, & Calantone, 2003; Sayre, 1996). Salim et. al (Salim et al., 2018) have described the global trends in enforcing environmental management systems, namely ISO 14001. In a research dated from 2000 to 2016, the authors emphasized the growing interest in ecological research. The important role of voluntary EMS can be seen in the form of achieving more sustainable production and consumption (SPC) practices. Sectoral studies revealed benefits of adopting an environmental management system. Benefits in the automotive sector include improvements in the market position of the company, in the relationship with stakeholders, in the environmental performance, and in the access to environmental technologies (Martín-Peña, Díaz-Garrido, & Sánchez-López, 2014).

Voluntary environmental certification schemes include the European EMAS regulation (Eco Management and Audit Scheme) and the ISO 14001 certification system. Both of them require organizations to introduce rules and procedures, to define environmental aspects and to improve their environmental performance (Daddi et al., 2017; Hillary, 2004; Testa et al., 2014). Both systems integrate environmental care into the business strategy as well as at the operational level. The main pillars of those systems consist of environmental elements, aspects, aims and procedures for an increase of the environmental performance.

ISO 14 001, an international private standard developed by the International Organization for Standardization (ISO) was issued in 1996 and, in 2015, a last version was published (ISO 14001:2015). The new ISO14001:2015 must be implemented by all certified organizations by September 2018. In 1993, the first EMAS regulation was launched (Regulation (EC) No 1836/1993) and in 2001 revised EMAS Regulation n. 761/2001 integrated the international environmental management systems based on ISO 14 001. The third revision was issued in 2009 (REGULATION (EC) No 1221/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, 2009) and new revision of the scheme is in progress (Preziosi, Merli, & D'Amico, 2016).

The adoption of the two instruments has different reasons. ISO 14001, as a minimum global-level requirement, is implemented in relation to external pressure - business partner requirements or company ratings and compliance. EMAS tends to be more internally driven and aims at improving environmental performance (Neugebauer, 2012). According to the International Organization for Standardization in Europe, ISO 14001 is adopted more than EMAS due to external pressures (Daddi et al., 2017), on the other hand EMAS supports environmental innovation for processes and products (Tourais & Videira, 2016). Analysis of the EMAS registration revealed that small firms were the vulnerable category as they faced difficulties in implementing EMS. The main reasons include internal factors: lack of resources (human and financial, time), short-term company orientation, awareness and, less important, insufficient external pressures and institutional problems (Daddi et al., 2017), (Preziosi et al., 2016), (Darnall, Henriques, & Sadorsky, 2008). Generally, a complex set of motivations is crucial for the decision to adopt environmental practices or not (Ayuso, 2006).

Along with the two main instruments, there are other voluntary international environmental standards, such as The Forest Stewardship Council (FSC) introduced in 1994 by a non-profit organization (Daddi et al., 2017). Alternative models of environmental management (AMEMs) include a wide range of sustainability management approaches (Beatrix Ransburg & Mária Vágási, 2007), such as The Natural Step (TNS) framework, which interconnects EMS with other environmental concepts, e.g. Life Cycle Assessment (LCA), ecological footprint,

and factor X. Product-oriented Environmental Management Systems (POEMS) is another practice which incorporates life cycle tools (Tourais & Videira, 2016).

Assessing the AMEMs is difficult due to data unavailability or intransparency. Many companies are not certified, hence the number of companies with AMEM is difficult to count (Heras & Arana, 2010). Specifically, authorization is often seen as one of the questionable aspects as companies might implement their own internal assessments, self-report to program managers, or are subject to external monitoring by an independent third-party auditor. Some interesting results regarding consequences towards environmental performance show that participants of voluntary environmental programs (VEPs) underperform those not implementing VEP, especially in comparison to self-monitor schemes (Darnall & Sides, 2008). Moreover, Melnyk et. al found out that companies with formal and certified EMS systems outperform those with formal but uncertified one (Melnyk et al., 2003). In the case of SMEs, introducing relatively simple and formal management tools, such as defining specific environmental targets, improve environmental impacts (Graafland & Smid, 2015).

Based on the literature, the size of a firm influences the proactive environmental practices. Small and micro firms tend to adopt proactive measures mainly driven by external aspects, by clients' requirements, competitors and entrepreneurs' attitudes, and strategic intents. As they are often part of structured supply chains and, tend to be influenced by client's requirements and behavior of competitors (Testa, Gusmerottia, Corsini, Passetti, & Iraldo, 2016), (Reyes-Rodríguez, Ulhøi, & Madsen, 2014), small and medium-sized enterprises (SMEs) have been increasingly integrated into global value chains facing requirements from value chain partners. Sustainable supply chain management is even more challenging since buyers tend to require more than a company does from their own suppliers (Lerberg Jorgensen & Steen Knudsen, 2006). On the other hand, some studies revealed lack of significant drivers to implement proactive environmental measures related to limited customer pressure (Nawrocka, 2008). Buyer – supplier relationship together with internal drive force might have positive effect on environmental capabilities in SMEs (Lee & Klassen, 2009).

Corporate environmental behavior is an emerging research field, which has been increasingly investigated, pushing for new environmental theories, such as the theory of environmentally significant behavior (Stern, 2000) which is interconnected with energy decarbonization policies (Stern, Sovacool, & Dietz, 2016). Corporate pro-environmental behavior is an important internal aspect, counting on some insights from environmental psychology. The voluntary pro-environmental behavior is in contrast with the organizationally prescribed behavior of employees modelled and explained by (Lülfs & Hahn, 2013). Utilizing Chinese panel data, authors He et al. analyzed factors influencing corporate environmental behavior (He, Xu, Shen, Long, & Chen, 2016). Both external pressures and individual corporate characteristics motivate enterprises to adopt active environmental behavior. Nevertheless, governmental environmental regulation has the most important effect. Therefore, corporate environmental behavior research should inform the environmental policy (Clark, 2005). In this context, managers´ values, attitudes, and perceptions influence either directly or indirectly corporate environmental response (Papagiannakis & Lioukas, 2012). According to Sarkis et. al., stakeholder pressure for the adoption of environmental practices results in three types of measures: eco-design, source-reduction, product life cycle assessment (LCA) and implementation of environmental management system practices (Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010).

Most business conflicts arise in the business environment as a result of an adverse event and uncertainty that destabilizes the integrity of the system of corporate social responsibility.

In line with the recently emerged research gaps in the broad field of sustainability approaches, we analyze current enterprise practices in the environment and energy fields within the selected industrial sector in the Czech Republic region. We examine the current relationship of business activities with environmental and energy

management. In addition, reasons behind the ecological behavior of companies are analyzed, i.e. environmental responsibility as potential differentiation for businesses (Khoma, Moroz, & Horyslavets, 2018).

A theoretical model linking market orientation and environmental performance was proposed examining the impact of business strategy on both individual employee level and firm level performances in environmental protection. It was found that market orientation positively affects environmental strategy, which then influences both environmental product quality and employees' environmental involvement (Chen, Tang, Jin, Li, & Paillé, 2015).

Czech manufacturing companies are usually certified by voluntary standard schemes ISO 14001: 2016 or EMAS. However, some doubts appear that EMS certified companies are unable to implement EMS procedures effectively. The authors explore this research problem so that different levels of EMS have been defined and tested. The authors defined the EMS levels based on current trends and requirements of the ISO 9001: 2016 standard and incorporated them into 9 research questions. Subsequently, first hypothesis was defined examining the relation of these aspects towards different EMS levels:
H1: Does a narrow relationship among the main items of EMS (9 questions) to a higher level of EMS exist?
The scope of the research questions is related to the results of the literature review and the requirements of ISO 14001: 2015 defined as follows:
Research questions
EMS1: The reason for implementing EMS
EMS2: Interaction of TOP management in EMS
EMS3: Defining the competences and responsibilities in the area of the environmental activities of the company
EMS4: Strategic concept for environmental policy till 2020
EMS5: Training of employees in the area of EMS
EMS6: Monitoring of current corporate environmental trends
EMS7: Reusing waste from production process
EMS8: Environmental risks and aspects through the whole product life cycle
EMS9: Involvement in environmental projects or other voluntary environmental activities

Studies in international business reveal that foreign firms have opportunities to outperform local firms when equipped with specific assets such as new technologies, well established management systems, and international experience. Foreign-ownership relations have been given little attention, espcially when it comes to the high standard of environmental management by foreign firms. A study by Kim et al. found that foreign firms are better performing than local firms in case they are under environmental pressure (Kim, Moon, & Yin, 2016). Moreover, this result is obvious in case of foreign firms originating from countries with relatively high environmental pressure. Their findings suggest that foreign firms can utilize better environmental management to address the demands of the host country. The authors found that the ownership structure might have a significant impact on the company's environmental approach and defined second hypothesis:
H2: The foreign ownership has positive impact on the level of EMS.

3. Methodology

Due to the complexity of the research objective, the authors proposed and conducted a multilevel study. Initially, the authors started with a preliminary research in order to detect and analyze in detail the current approaches in the environmental management. The preliminary research was based on two parameters – size of a company in terms of employee numbers (micro, small, medium and large) and type of core business activity (CZ NACE classification), both of them related to the requirements of the environmental management system according to the norm ISO 14001: 2015 Environmental system management - Requirements. The main goal of the preliminary research was the in-depth analysis of the attitudes towards solving environmental requirements in production

companies in the Czech Republic. This research was focused on 16 companies (micro and small, medium, large) from the most important industrial fields of the Moravian region. This qualitative research based on 34 structured questions led to detailed information about the research areas providing the benefits of personal feedback and detailed explanations. The results of qualitative research were processed by descriptive statistics. The research questions were divided into 4 areas: level of environmental system, environmental policy and communication, environmental performance monitoring and trends in environmental management.

Subsequently, based on this preliminary research, the authors cooperated only with the target group, namely medium and large production companies in the Czech Republic regardless of their core business activity (CZ NACE classification). The main part of the primary research was designed on the basis of the preliminary research results and the current requirements of ISO norm 14001: 2015. The main goal of this research is oriented towards the verification of the possible higher level of environmental management system engagement in comparison to the basic requirements of ISO norm 14001: 2015. Authors aimed to find out signs of proactive corporate environmental behavior in the Czech medium and large production companies. They exploited a frequently used database called Albertina, which includes information about 3 million companies from the Czech Republic and Slovakia, the business sector, the economic situation and direct contacts with owners and management.

The selected sector of the questioned companies involved about 5 000 medium and large production companies dealing with the norm ISO 14001: 2015 Environmental system management - Requirements. An electronically distributed questionnaire was used to collect the data. A final group of 247 large and medium-sized Czech manufacturing companies (5% success in return of the questionnaire) from different industrial branches participated in the survey. The differentiation of the companies based on the ownership status was decided as follows: 58% (143) domestic majority owner, 24% (59) foreign majority owner, 12% (30) subsidiary company – foreign majority owner and 6% (15) subsidiary company – domestic majority owner. To evaluate first hypothesis, the structured equation modelling was used. In first step, the exploratory factor analysis, was performed. To evaluate second hypothesis, the linear regression (LR) was used. The analysed data include also companies' annual reports, web pages and other public sources.

4. Results

Preliminary research
The research results are analyzed from two perspectives. Firstly, comparisons were made to analyze the differences among three groups based on the size of the company in terms of employee numbers – micro and small, medium or large company. Secondly, the different levels of EMS implementation between the two CZ NACE business fields were taken into account.

Results of the qualitative research show that although the micro-sized and small companies in the researched sample (3 and 3) fulfill the legislative requirements related to the environment, they do not implement any voluntary EMS. Moreover, any other elements of the EMS are missing in their management systems. The research sheds light into companies' voluntary EMS. The results show that there is no difference between the two groups of companies (CZ NACE 1 versus CZ NACE 2), in terms of implementation level. The outcome also indicates that core business area is irrelevant to the performance monitoring or EMS implementation level. Medium-sized and large companies are more devoted to the environmental activities, and more financial sources are available for an increase of information awareness. The most important environmental aspects mentioned in the survey include waste and water management, air protection, chemical substances management, packaging, accident prevention and energy management. These aspects are dependent on the core business of the company. The results indicate that the level of EMS requirement fulfillment is independent from the duration of EMS implementation.

In summary, the results indicate different EMS implementation levels. This different levels of EMS have been obvious in the following elements: strategy concept of environmental policy at least 3 years ahead, pro-active management approach, following trends and rules for internal communication. The authors conclude that a "tripple bottom line company" is an environmentally friendly enterprise optimizing its cost of environmental management and being aware of environmental risks.

Legal requirements must be fulfilled by companies regardless of the availability of certified environmental management system. However, research questions go beyond legal requirements, encompassing also environmental managements systems and other voluntary environmental instruments. The answers of the questionnaire are divided into three areas in line with interpretation of these three factors.

Legal environmental management system includes corporate environmental activities based mostly on the compulsory legal requirements. Responsibilities and authorities for environmental activities are not defined, employees are not trained in this area, and the environmental trends are not followed regularly. *Basic environmental management system* is based on the certifications implemented in the company and based on the intention of either the parent company or of the TOP management, which defines the policy and objectives of EMS. Moreover, they are active in reviewing the EMS - reminding the proposed objectives and appointing a representative or any other person as responsible for corporate environmental activities. No corporate environmental strategy is available, only short-term environmental policy and objectives have been defined. However, companies might consider waste reuse from production processes. These companies do not manage environmental risks and aspects throughout the whole product life cycle. Companies have applied *mature environmental management system*, which has been implemented on the basis of the TOP management strategy and stakeholders' requirements. A matrix of responsibilities and authorities is created across EMS activities and together with specific employee positions a long-term environmental strategy is defined. These companies manage environmental risks and aspects through the whole product life cycle and solve environmental opportunities as well. Companies reuse waste from production process. Training of employees in the area of EMS takes place on a regular basis in various forms, i.e. internal audits, regular internal training, participation at external trainings or conferences, and collaboration with universities or research institutions focused on the environment. Companies monitor current corporate environmental trends on regular basis.

Based on the preliminary research authors concentrate on medium and large production companies in the primary research with different environmental aspects and business areas.

Primary research
The first result from the correlation matrix based on the explanatory factor analysis indicated that EMS3 had low and negative correlations with all other EMS indicators. The indicator EMS3 was therefore eliminated from the next analysis. The results of correlation matrix are shown in the following table.

Table 1. The results of dependencies between factors without EMS3

		EMS 1	EMS 2	EMS 4	EMS 5	EMS 6	EMS 7	EMS 8	EMS 9
Correlation	EMS1	1.000	.514	.538	.510	.465	.013	.160	.166
	EMS2	.514	1.000	.504	.595	.526	.162	.306	.181
	EMS 4	.538	.504	1.000	.773	.561	-.064	.334	.197
	EMS 5	.510	.595	.773	1.000	.602	.072	.383	.251

	EMS 6	.465	.526	.561	.602	1.000	.127	.267	.356
	EMS 7	.013	.162	.064	.072	.127	1.000	.189	.205
	EMS 8	.160	.306	.334	.383	.267	.189	1.000	.182
	EMS 9	.166	.181	.197	.251	.356	.205	.182	1.000
Sig. (1-tailed)	EMS 1		.000	.000	.000	.000	.421	.006	.004
	EMS 2	.000		.000	.000	.000	.005	.000	.002
	EMS 4	.000	.000		.000	.000	.158	.000	.001
	EMS 5	.000	.000	.000		.000	.130	.000	.000
	EMS 6	.000	.000	.000	.000		.023	.000	.000
	EMS 7	.421	.005	.158	.130	.023		.001	.001
	EMS 8	.006	.000	.000	.000	.000	.001		.002
	EMS 9	.004	.002	.001	.000	.000	.001	.002	

Notes: Level of Significance equal 0.05; the results from IBM SPSS software

Source: the authors

Generally, the results of dependencies between indicators were statistically significant. After excluding the factor EMS3 a new factor analysis was performed.

Table 2. The results of Kaiser-Meyer-Olkin test and Bartlett´s test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.825
Bartlett's Test of Sphericity	**Approx. Chi-Square**	693.366
	Df.	28
	Sig.	.000

Notes: Level of Significance equal to 0.05; Df. – Degree of Freedom; the results from IBM SPSS software

Source: the authors

KMO (Kaiser-Meyer-Olkin) measure has achieved thevalue 0.825 with statistical significance of Bartlett's Test p<.0001. It is likely that a two factor model is more appropriate to describe relationship between main indicators of EMS. In order to define, which indicator belongs to which factor and factor loadings, the Varimax rotation was performed. The results of Varimax rotation might be interpreted as two extracted factors. The first factor grouping covers following indicators: EMS1, EMS2, EMS4, EMS5, and EMS6. The second factor group covers following indicators: EMS7, EMS8, and EMS9. Based on the statistical analysis, 59.68% of the total variance was explained. Pearson's coefficients of correlation (see table 1) have reached levels beyond 0.50, which indicates strong and statistically significant relation between variables (p<.0001). In the next step, structural model (AMOS software) of relationships between indicators of EMS was proposed (see figure 1).
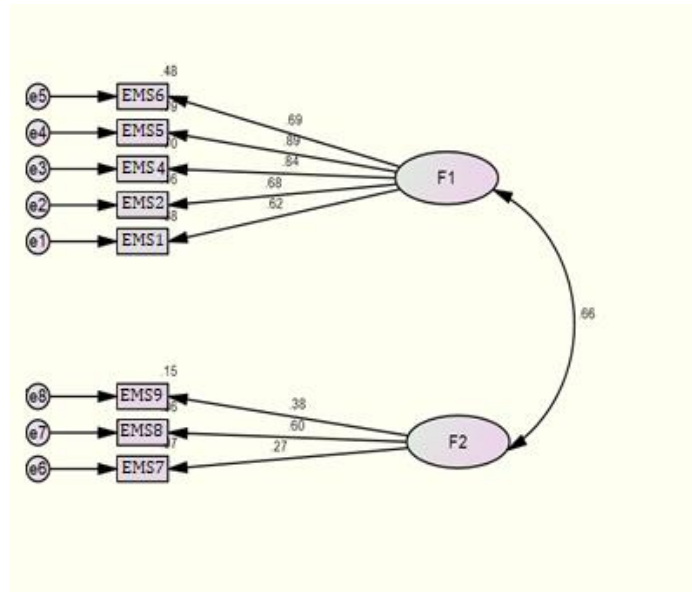
Figure 1. The results of Kaiser-Meyer-Olkin test and Bartlett´s test (standardised loading factors)

Source: the authors

The factor loadings reached the minimum limit (0.25 level). As a result, all factor loadings from the first group and the second group are acceptable. Based on this, FIT - characteristics of structural model had to be calculated (see table 3).

Table 3. The results of structural model Fit Summary

χ^2	χ^2/df	RMSEA	RMR	CFI	NFI	GFI	IFI	RFI
χ^2=40.66; df=17 (p<.001)	2.39	0.075	0.024	0.965	0.942	0.962	0.966	0.905
Accepted fit	<3	<0.08	<0.10	>0.90	>0.90	>0.90	>0.90	>0.90

Notes: Level of Significance equal to 0.05; Df. – Degree of Freedom; the results from IBM AMOS software

Source: the authors

The results of FIT characteristics indicate, that the variables have been grouped into two latent variables and CFA (confirmatory factor analysis) was carried out, applying the maximum likelihood method. The overall fit of the model to the data has been proven through value of Chi- square = 40.7, df=17 and their ratio Chi- square/df= 2.39, whereby the ratio lower than 3 suggests that model fits to the data. The other fit indexes were also observed and proved acceptable fit meaning that the first hypothesis is confirmed.

In case of H2, the method of linear regression was used to model the relationship between variables (owner structure of company (OSC) – the dependent variable, nine levels of EMS – the independent variables). The calculation did not aim to forecast the values of the variables, only statistically significant levels of EMS were determined. This idea of data evaluation was used in several quantitative studies (Hudakova, Masar, Luskova, & Patak, 2018); (Dvorsky, Rózsa, Petráková, & Kotásková, 2018).

The linear trends between the dependent variable and independent variables (EMS1; …; EMS9) can be seen in the results of the scatter plots. Graphical analysis of normal distribution of independent variables showed

divergencies between the histogram and normal distribution curve in the EMS1, EMS2 and EMS8 independent variables. The results of the testing of the descriptive characteristics (skewness: EMS1= 4.159; EMS8=7.654 and kurtosis: EMS1=4.744, EMS5=5.451) using the z-score confirmed that these independent variables do not meet the normal distribution assumption. The coefficients of correlation (through correlation matrix) between OSC and independent variables (EMS2, EMS3, EMS4, EMS6, EMS7, EMS9) proved a strong positive correlation. The results of the testing (α - the level of significance equal 0.05) carried out for the sake of verification of the statistical significance of regression coefficients (through t-tests) showed no statistically significant independent variables EMS6 and EMS7 (EMS6: t-value= 0.465, p-value=0.584; EMS7: t-value= 0.165, p-value=0.784). According to the results of t-tests, the independent variables (EMS2, EMS3, EMS4 and EMS9) are statistically significant (p-values of t-tests are less than α).

The function of the linear multiple regression model (with 4 independent variables) is:

$$OSC= 1.794 + 0.174 \times EMS2 + 0.148 \times EMS3 + 0.163 \times EMS4 + 0.131 \times EMS9 + \varepsilon t; \qquad (1)$$

whereby OSC – the dependent variable (Owner structure of company); EMS2, EMS3, EMS4 and EMS9 – independent variables; εt – error term.

The regression model is statistically significant (F- ratio =6.589; P-value=4.755E-5). The differences between the determination coefficient (R^2) and the adjusted determination coefficient are minimal (R^2 - 0.685 and Adjusted R^2 - 0.682). The Variance Influation Factor (VIF) demonstrated the absence of the effect of multicollinearity (VIF independent variables had lower value than the critical value 5 (Hair, Black, Babin, & Anderson, 2010): EMS2 = 3.684; EMS3 = 4.101; EMS4 = 2.145; EMS9 = 3,228). The autocorrelation was rejected for OSC function as Durbin-Watson statistics (D –W statistics = 1.547) indicated the value between the upper critical value (1.627) and the lower critical value (1.202). The results of the Shapiro-Wilk test showed that the assumption of the normality of the errors distribution can be confirmed because the p-value of S–W statistics (p- value = 0.07) is higher than level of significance.

The results of linear regression showed that the owner structure of a company has an impact on the level of interaction of TOP management in EMS (0.174); on the level of defining the competences and responsibilities in the area of company´s environmental activities (0.148); on the level of strategic concept for environmental policy till 2020 (0.163) and on the level of involvement in environmental projects or other voluntary environmental activities (0.131). The second hypothesis is confirmed as well.

Discussion

Studies point to the fact that the most important factor influencing the environmental performance of companies is the country's legislative framework. This has already been highlighted in a study mentioning that government regulation is the most important external factor effecting environmental behavior (Clark, 2005). The authors found that although the micro-sized and small companies meet the legislative requirements related to the environment, they do not implement any voluntary EMS. Medium-sized and large companies are more devoted to voluntary environmental activities.

Czech manufacturing companies are usually certified by standard ISO 14001: 2016 or EMAS. Daddi et al. (Daddi et al., 2017) highlighted the importance of a voluntary environmental management tool in development, implementation, management, coordination and monitoring of the environmental activities of organizations. Some studies point to the fact that EMS certified companies are unable to effectively implement EMS procedures.

This research confirms that most of the EMS-certified companies are unable to effectively implement EMS procedures as well. Authors investigating environmental behavior in medium and large ISO 14001: 2016 certified firms found that despite the EMS certification, there exist different EMS levels. The authors examined 9 areas (questions) related to the possible existence of differentiated EMS level. The research results point to a strong link between these environmental activities: high involvement of TOP management in the EMS implementation, maintenance and improvement of EMS and strategic concept for environmental policy till 2020, training for employees in the area of EMS and monitoring of current corporate environmental trends.

The second group of environmental activities relates to: reusing waste from production process, environmental risks and aspects through the whole life cycle, and involvement in environmental projects or other voluntary environmental activities. The final result confirms the hypothesis that there are companies with higher EMS levels.

This different level of EMS has been indicated in the following research areas: strategic environmental policy concept at least 3 years ahead, proactive management approach, trends and internal communication rules. Already in their study Papagiannakis and Lukas (2012), they highlighted the attitudes and values of managers influencing directly or indirectly the environmental response. Also the author Chen et al. (2015) stateed that the market orientation positively influences environmental strategy, which affects both environmental quality and environmental involvement of employees.

The second hypothesis was also confirmed based on the results. The foreign ownership has a positive impact on the EMS level. A study by Kim et al. found that foreign firms perform better than local firms in case they are under environmental pressure (Kim, Moon, and Yin 2016). Foreign companies are probably aware of the importance of environmental behavior not only from the global perspective, but also in their overall performance.

Conclusions

The paper addresses corporate environmental policy practices concentrating on the current relationship of business activities towards environmental management in the Czech Republic. This publication presents research results from the two subsequent research activities: preliminary in-depth company questionaire research and statistical modelling based on quantitative data. Three levels of EMS were identified: legal, basic and mature, and nine research questions were evaluated according to the requirements of ISO 14001: 2015. The research concentrated on the detection and testing of a higher level of EMS based on two hypotheses on EMS level and ownership structure.

The results confirmed that narrow relationship among the main items of EMS (9 questions) to a higher level of EMS exist, called *mature environmental management system*. This environmental management system is characterised by senior management strategy approach and monitoring of the requirements of the stakeholders. These companies have developed long-term environmental strategy, which is actively supported by all employees across the organization. Regular training of employees in the field of environmental issues takes place. Following the strategy, environmental risks and aspects are being processed and monitored throughout the product lifecycle. These companies are engaged in active implementation of environmental opportunities and reuse production waste. High levels of social responsibility awareness and new trends application into companies´ strategies are typical.

Moreover, foreign company owners have a better understaning of to the different levels of EMS in comparison to the domestic majority owners. The foreign ownership has positive impact on the level of EMS. The limitation of the research is related to the sample size and questionnaire feedback rate. The greenwashing effect needs to be

considered as well and for the future more research activities should be devoted to the EMS practices on the national level but also international level.

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