

Adopting environmentally friendly mechanisms in the hotel industry

A perspective of hotel managers in Central and Eastern European countries

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Abstract

Purpose – This paper aims to assess how a hotel geographical location in different parts of Central and Eastern Europe influences the complexity of perception of pro-environmental behavior.

Design/methodology/approach – To find out, whether hotel location in a specific country influences the complexity of environmental practices, this study used two closely connected multivariate statistical techniques analyzing gradients: principal components analysis and partial redundancy analysis. The research comprises data collection from seven countries in Central and Eastern Europe. In all, 25 randomly selected hotels (based on star rating) from various countries were approached to complete a questionnaire. Environmental practices were studied based on motivations, perception of barriers, perception of support from different levels of public sector, will of managers to promote pro-environmental measures based on sufficient funding, perception of legislation and perception of various other important factors.

Findings – The study reveals significant differences between hotels in Central Europe and Eastern Europe in the perception of the complexity in implementation of the environmental practices by hotel managers. The character of the present study, however, needs to address the identification of particular aspects that are relevant to the geographical differences among the studied countries.

Research limitations/implications – Research was limited to a selection of Central and Eastern European (CEE) countries. There is still probability that managers in hotels from Poland and Croatia could possess different preferences. Other limitation of this study is that only special part of hotels were asked – hotels certified by star grading, out of our scope remained other hotels. It is also known that important factor is precise location of hotel within country – hotels in established tourism destination behave other way that



those outside recreational areas. These factors deserve further study within this topic. There are many aspects of sustainability and environmental protection regarding hotel industry. As we have found in our principal correspondence analysis, different environmental measures were different location in biplot – some were affected by country, the other by star grading and affiliation to hotel chain. The complexity deserves to be studied in depth.

Practical implications – The importance lies first in the identification of the aspects that are governed by geographical differences among the countries studied. These aspects are the initiatives and support from the government and the local governments, which counteract the perception that there is a lack of financial resources and the return on investments is slow. So, based on the data, which included information from various types of hotels from seven CEE countries, the activities of national and local authorities were identified to be the main differentiating variable. The support of the environment-friendly conduct of business in the hotel industry is appreciated by hotel managers from Central Europe. On the other hand, hotel managers from Eastern Europe do not feel any significant support from either national or other public institutions. The second factor of differentiation is represented by the perception of the lack of funds. Hotel managers from Eastern Europe feel strongly about funds limitation. The coherence of both those factors is obvious in the results, as they show the same direction but opposite orientation. It has already been discussed above. When looking at the results, the authors find the perception of availability of funds to be a fundamental difference between hotel management in Central Europe and in Eastern Europe. The lack of funds is perceived more intensively in Eastern Europe than in Central Europe, particularly because of a stronger awareness of direct or indirect support for such activities by national and other public institutions in Central Europe.

Social implications – The differentiation of the aspects mentioned above comes from the social and culture policies, company policies and business cultures between these two sub-realms. Pro-environmental actions are apparently promoted less publicly in Eastern European countries than in Central European countries. The reaction to the trend for demand of greener hotels is stronger in the West, and its hotels are more likely to have legislation requirements and public support as an incentive to adopt pro-environmental measures in their business operations.

Originality/value – The study is based on data obtained from seven countries. The results revealed a problem of the macro-environmental influence on hotels' potential to implement environmentally sustainable approaches and procedures throughout the industry.

Keywords Environmental management, Perception, Sustainability, Central and Eastern Europe, Hotel management, Multivariate analyses

Paper type Research paper

1. Introduction

Tourism is considered as an important polluter of the environment (Gössling, 2002; Becken and Simmons, 2008; Della Volpi and Paulino, 2018) where consumption of resources linked with accommodation services raises many questions (De Grosbois, 2012). Therefore, it can be argued that the role of hotel managers related to pollution and consumption of resources in tourism sector prove to be significant (Prud'homme and Raymond, 2016). The introduction of environmental management into business and adoption of pro-environmental measures has been a common concern for already a significant period of time in the hospitality industry in Western world – at least in reputable hotels (Kirk, 1998).

However, only in recent years the adoption of environment-friendly measures and procedures have taken place in Central and Eastern European (CEE) countries (Mihalić *et al.*, 2012). There is often a pressure through the environmental legislation with new environmental laws and policies that require hotels and other similar establishments to introduce environmental measures (Bonilla Priego *et al.*, 2011), though, these may proceed frequently without any ambition to go beyond the legislative requirements. Awareness is on the increase, spreading from West to East. So far, a significant attention has not been paid to the issue, and the lack of knowledge is still apparent in this field. That is why the main objective is to assess the influence of hotel locations in different parts of Central and Eastern

Europe on the complexity of environmental practices implementation in the hotel industry to expand the knowledge in the field of environmental practice related to tourism.

1.1 Sustainability and environmental protection in the hotel industry

Implementing sustainability and pro-environmental ways of operating brought a wide range of practical issues in hotels, examined by Kirk (1998), March *et al.* (2004) and Mihalič *et al.* (2012). There are both internal and external reasons for studying environmental change in hotel industry. Among important internal factors are employees, whereas, external factors are linked with the respective stakeholders (Peršić *et al.*, 2005) and the perceived competition or level of perceived industry rivalry (Le *et al.*, 2006).

The introduction of sustainable practices varies. There are, for instance, measures seeking to reduce energy consumption (Xuchao *et al.*, 2010), promoting the use of renewable energy sources (Xuchao *et al.*, 2010; Silva and Delicado, 2017), encouraging water management (March *et al.*, 2004), water conservation (Iwanowski and Rushmore, 1994), waste management (Kumar, 2005), recycling and reusing (Iwanowski and Rushmore, 1994), preferring local sources (Meyer, 2006), opting for local food supply (Elmont, 1995; Švec and Solarová, 2016), preferring eco-friendly vendors/suppliers (Iwanowski and Rushmore, 1994), eco-friendly services or eco-friendly components of services (Tseng and Kuo, 2013) and servicing tourists' demands (Löke *et al.*, 2018). Attitudes of hoteliers, hotel management toward "eco-innovation" and their introduction have been explored. The can relate to high investment cost of environmental innovations (Aguilo *et al.*, 2005) or to clear motivations in terms of financial savings (Kirk, 1995).

Environmental management does not have to involve intensive projects on capital and may not necessarily introduce increased running costs (Kirk, 1995). A large portion of potential savings can be achieved through relatively simple and inexpensive measures related to water consumption (Styles *et al.*, 2013) or lighting (Scholz and Linderová, 2016). Moreover, there is a prospect of reducing operating costs as a result of environmentally friendly investment (Bohdanowicz, 2006).

Frequently approached topics include certification and eco-labeling. Difficulties are brought by the existence of quite a significant number of ecolabels or environmental certification schemes in this area (Font, 2002). Environmental certification may economically benefit only a certain size of hotel (Segarra-Oña *et al.*, 2012), and even in these cases, the effect of certifications on profitability is questioned (Geerts, 2014). There are many barriers in adopting the formal environmental management system (EMS), such as lack of knowledge and skills, lack of professional advice, uncertainty of outcome, certifiers/verifiers, lack of resources and implementation and maintenance costs (Chan, 2008).

1.2 Perception of environmental protection by hotel managers

The hotel industry seems to be trailing behind other environmentally sensitive sectors (Hsieh, 2012). However, managers in chain-affiliated hotels are more likely to pay attention to environmental issues than independent operators (Bohdanowicz, 2005). Their concerns also bear a strong relationship to hotel star ratings (Chan, 2008). It is suggested that top managers' environmental attitudes influence hotels' environmental management activities (Park *et al.*, 2014). More recently, it was confirmed that employees' attitude influences the environmental performance of hotels (Chan, *et al.*, 2017). It has been found, that there are many factors influencing decision-making regarding the pro-environmental orientation of hotel management – the literature is oriented especially on motivations, barriers, support by the public sector, and perceptions of legislation.

1.2.1 Motivations. Industries are motivated to adopt environmental management practices and implement the eco-innovative elements for different reasons. Zmud (1984) found that the attitude of top management and organizational receptivity toward change both influenced organizational innovation. Rennings (2000) identified a regulatory push and pull effect on eco-innovation. Nicholls and Kang (2012) revealed that hotel managers show substantial differences between their perceptions of the importance of environmental initiatives and their actual adoption. Among others, motivational effects on hotel management (Quazi *et al.*, 2001), corporate governance, cost savings, competitive advantage, legislation and consumer pressure were found to be the most important aspects (Chan and Wong, 2006).

1.2.2 Barriers. Various barriers to the implementation of positive environmental practices have been identified and studied directly in hotel industry:

- lack of knowledge and skills;
- lack of professional advice;
- uncertainty of outcomes;
- certifiers/verifiers;
- a lack of resources; and
- implementation and maintenance costs (Chan, 2008).

Post and Atma (1994) list organizational barriers – such as attitudes of personnel, understanding of top management, internal communication and administrative heritage (past practices/standard operating procedures), as well as industry barriers (capital costs, community concern, regulatory constraints and the availability of information or technical knowledge).

1.2.3 Support by public sector. Support from the government, local governments or NGOs plays an important role in promoting environmental management practice in businesses (Delmas and Toffel, 2004). Lack of such is counted as a salient factor hindering the adoption of environmental management practice (Massoud *et al.*, 2010).

1.2.4 Will of managers to promote pro-environmental measures based on sufficient funding. Hillary (2004) states that the lack of accessible financial support is one of the most significant factors in the low implementation of EMS. Yet, Počuča *et al.* (2017) found poor representation of adapted financial mechanisms to be a major constraint to the introduction of eco-friendly measures in business in many countries.

1.2.5 Perception of legislation. Many hotels implement higher environmental standards, since they wish to avoid legal challenges (Bonilla Priego *et al.*, 2011). Many experts and managers who prioritize environmental management implementation see government regulation and therefore the legal pressure as a priority in adopting sustainability approaches (Seuring and Müller, 2008). Based on numerous theoretical conclusions and empirical results (Jones, 2010), it puts regulatory pressures among the strongest determinants of voluntary environmental management strategy. Mazzi *et al.* (2016) concluded that one of the main uses of a certified EMS was related to the compliance with legal requirements. On the other hand, Shen and Tam (2002) concluded that a potential lack of government legal enforcement was an insignificant factor.

1.3 Hotel management in Central and Eastern Europe

Tourism in CEE countries had differed considerably from that in the West – at least until the nineties – not only in terms of the development of tourist numbers, the national distribution

of tourists and the organization of the tourist industry, but also in respect of the national patterns of tourists (Vuoristo, 1981). Thus, there were several inherent problems in adopting ecotourism in the region (Hall and Kinnaird, 1994). The following transformation or transition made it easier to imbue the future development of sustainability (Hall, 2000). However, the transition process is diversified in CEE realm – especially the Visegrads group (Czech Republic, Hungary, Poland, Slovakia and Slovenia) underwent a faster and more advanced development in tourism than South-Eastern European countries (Hall, 1998). European ecotourist' requirements and expectations vary according to the country of their origin (Dragan *et al.*, 2014; Vujko *et al.*, 2018). Green hotels or hotels adopting at least some environmentally friendly measures appeared successively in Central and Eastern Europe in the last twenty years in various numbers in particular countries (Pavia *et al.*, 2013).

Development in the private sector during the communist period was limited – e.g. representing 20 per cent of Gross Domestic Product (GDP) in Poland in 1989 (Sinitina and Chudakova, 2005) or just 3.3 per cent of GDP Product in Czechoslovakia in 1983 (Bohata and Mladek, 1999). We can identify a significant general qualitative and quantitative improvement in the hotel industry regarding both the number of hotels and their quality/category (Vukosav and Čurčić, 2013). Hotel chains applied mostly non-equity modes (franchise, management contract, lease, and marketing consortium) for penetrating the markets (Ivanova and Ivanov, 2014).

Hotel investment increased in Central and Eastern Europe (Bader and Lababedi, 2007) and the hotel management has seen various improvements, such as in human resources (Lucas *et al.*, 2004), performance measurement (Buhovac and Groff, 2012), ethical standards (Fox, 2000), yield management (Ivanov, 2006), quality management (Blešić *et al.*, 2011), revenue management (Ivanov, 2014), customer relationship management/CRM (Josiasen *et al.*, 2014) and sustainability (Knežević Cvelbar and Dwyer, 2013), environmental management, and eco-labeling (Bradić *et al.*, 2017). Generally, international hotel chains have become more efficient than national hotel chains or hotels that are independently owned (Assaf and Barros, 2013).

Based on this information, we can conclude that there is an interest in the environmental issues in hotels located in CEE countries, but this interest is different from western countries. This topic has not been researched yet, and what we want to test statistical null hypothesis that there is no influence of the hotel location on the complexity of sustainability aspects and environmental protection regarding hotel industry across CEE countries.

2. Methodological practice

Data, necessary to test our hypothesis, were acquired through primary research – by questioning hotel managers via electronical questionnaire in different CEE countries.

2.1 Study design and sampling

The study area for our purpose was defined as countries of CEE – here comprising European post-socialistic countries of the former soviet bloc, European post-soviet countries west of Russia Federation, and Turkey. We used a stratified random sample of countries to study. CEE countries were divided into four geopolitical groups:

- (1) states of the Baltic Sea (Estonia);
- (2) other European post-Soviet countries (Ukraine);
- (3) states of the Balkan Peninsula (Bulgaria, Turkey); and
- (4) Central European (CE) countries (Slovakia, Slovenia, Czech Republic).

Unfortunately, there is no comparable database of all hotels from all selected countries so, it is impossible to make a simple random selection of hotels. However, databases of hotel star rating are accessible and these databases were used for hotel selection. As there were different numbers of hotels in grading levels, hotels were chosen by stratified random selection. The stratification was based on the proportion of hotels in grading levels (number of stars) in each country hence 25 randomly selected hotels were chosen from each country.

Managing directors of all selected hotels were approached initially by telephone (communication in native language) between February and April 2015. During this period, the contact e-mail addresses for direct communication nominated by the managing directors were collected. The managing directors themselves or high-level managers nominated by them took part in our survey.

Based on our findings from a pilot survey (in 12 hotels), we have decided to exclude questions on demographic data from the final version of the questionnaire to support the response rate. Our reassessed questionnaire was distributed to 25 hotels in each of the seven countries selected for our survey (175 together).

A complete response rate was 67 per cent having 126 questionnaires returned. Some questionnaires were omitted due incompleteness. The net response rate was 64 per cent (= 120 questionnaires), varying from 36 per cent in Estonia to 80 per cent in the Czech Republic and in Turkey. The response rate varied not just in countries but also in different hotel rating (Table I).

2.2 Survey tool

- *Motivations.* The motivation constructs used in our study are based on the push and pull model of motivation to innovate, as environmental practices are considered by researchers as innovations. A set of questions was designed consisting of seven motives and a seven-point scale (1 = the least important to 7 = the most important).
- *Barriers.* Barriers to implement environmental measure were considered equally important, therefore, a set of questions listed six barriers and a seven-point scale (1 = the least important to 7 = the most important) to determine the level of importance.

	BUL	CZE	EST	SLO	SVK	TUR	UKR
<i>Hotel chain</i>							
Yes	1	11	2	5	5	3	4
<i>Number of stars</i>							
1	0	1	0	0	2	2	0
2	1	2	0	1	2	2	2
3	11	7	0	3	10	5	6
4	8	5	7	7	5	7	7
5	0	5	2	2	1	4	3
<i>Number of rooms</i>							
Up to 20 rooms	1	1	0	3	5	0	6
21-50 rooms	10	9	0	3	8	7	7
51-100 rooms	9	4	1	4	3	3	3
101-250 rooms	0	5	3	3	4	9	2
251 rooms and more	0	1	5	0	0	1	0

Table I.
Number of hotels in
specific types among
studied countries

- *Support by the public sector.* We used three areas of support within three levels of the public sector (government, local governments and municipalities, non-government organizations). A five-point scale (1 = No initiative nor support, 2 = Very little support, 3 = Little support, 4 = Significant support, 5 = Excellent support) was used.
- *Will of managers to promote pro-environmental measures based on sufficient funding.* The influence of available financial support on willingness to implement environmental practices was also measured by a five-point scale (1 = Demotivated; 5 = Extremely motivated).
- *Perception of legislation.* The perception of legislation underpinning better environmental protection was measured on a five-point scale (1 = very negative; 5 = very positive).
- *Perception of other important factors.* Managers were asked to evaluate, from their point of view, the importance of the following factors of environmental protection development in the hotel industry: better information accessibility, environmental certification or EMS implementation costs, complicated environmental certification or EMS implementation process, environmental certification and EMS propagation, environmental awareness of hotel guests, extra financial funds or sources, competition in the market and green trends in the market. The perception of these factors was assessed on a five-point scale (1 = completely unimportant; 5 = very important).

2.3 Data processing

The complexity of perceptions of environmental practice implementation and the relation of its complexity to hotel location were our key interests. Multivariate statistical techniques had to be used as we had many right-hand variables (= dependent variables). We also had more left-hand variables (= independent variables). Dependent variables were collected by the questionnaires (aspects of sustainability and environmental protection regarding hotel industry). Independent variables for our use were country of origin of the hotel, number of stars of the hotel and affiliation with a hotel chain. The influence of hotel location on the complexity of perception of environmental practice implementation was the main interest.

Multivariate techniques reduce the number of gradients from many measured variables to a few gradients that are important in the whole dataset and ordination methods are most common methods to reveal such gradients (ter Braak and Smilauer, 2012). Unconstrained methods analyze only one-sided variables – usually the dependent variables. The independent variables are then recalculated to new gradients; thus, unconstrained methods are purely explorative. Basic unconstrained ordination methods for such an assessment are linear Principal Component Analysis and unimodal Correspondence Analysis (Quinn and Keough, 2002). The use of one of those methods is given by the identified length of gradient expressed in multiples of the standard deviation (ter Braak and Smilauer, 2012).

Dependent variables (= responses of managers to all items of perception of implementation of environmental practices) were log transformed, centered and standardized. The result of Principal Component Analysis was analyzed with ordination diagram (ter Braak and Smilauer, 2012). The potential relation between responses (ordination scores) and independent variables was further tested by Spearman Rank Order Correlations. The relation between the structure of dependent variables and independent variables was tested using Redundancy Analysis, which is a constrained extension of

principal component analysis (Leps and Smilauer, 2003) – in the case of redundancy analysis the independent variables becomes part of the ordination analysis.

Since we were interested only in the impact of a “country,” and since we found by Principal Component Analysis that the number of stars as well as hotel chain affiliation could be important for differentiation of the complexity of responses, we used partial canonical ordination instead of classical canonical ordination (ter Braak and Smilauer, 2012). The effect of the first canonical axis, as well as the whole model, was tested by Monte Carlo permutation test.

Principal Component Analysis and partial Redundancy Analysis were performed by algorithms of the CANOCO5 package. Spearman Rank Order Correlations were analyzed using StatSoft Statistica 12.

3. Results

The main aim of our paper is to evaluate the possible impacts of a hotel location in different countries of Central and Eastern Europe on the complexity of environmental practices using ordination methods.

3.1 Outcomes of explorative analysis

The first Principal Component Analysis axis is by far the most important gradient in our dataset (Table II, Figure 1). It alone explains 15.12 per cent of our dataset variability. The second Principal Component Analysis axis explains 9.16 per cent of dataset variability. Both, the first and the second axis, are the most important in our dataset. They, and especially the first axis, are well correlated with independent variables. Total adjusted variation explained by independent variables is 8.4 per cent. The first Principal Component Analysis axis reached pseudo-canonical correlation 0.625 (Table I). The differentiation of hotels classified by county is influenced by first axis (Figure 1) – all hotels from Turkey and almost all Bulgarian hotels as well as many Ukraine hotels are on the left of the graph; conversely, hotels from Slovenia and Czech Republic are on the right of the graph. Thus, first axis could be related to the differentiation of hotels according to the country of origin.

We have more independent variables at hand and their position as well as directions of change of the dependent variables can be found in Figure 2. The axes here are the same as in

Result	Axis	PCA	Partial RDA
Eigen values	1st	0.151	0.063
	2nd	0.092	0.020
	3rd	0.075	0.014
	4th	0.065	0.013
Pseudo-canonical correlations	1st	0.625	0.687
	2nd	0.341	0.569
	3rd	0.400	0.605
	4th	0.403	0.505
Explained cumulative	1st	15.1	6.5
	2nd	24.3	8.5
	3rd	31.8	9.9
	4th	38.3	11.3

Notes: Test of Redundancy Analysis (1st axis: F -ratio = 7.123; p = 0.002; whole model: F -ratio = 2.470; p = 0.002)

Table II.
Summary of
principal component
analysis and partial
redundancy analysis

Figure 1.
Principal component
analysis ordination
plot of first and
second principal
component analysis
axes with hotels
classified according
country

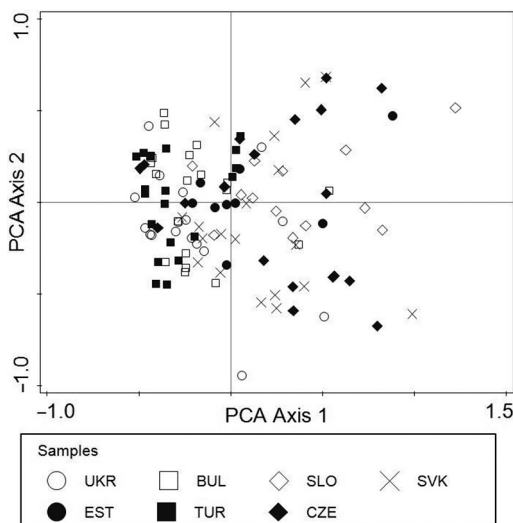
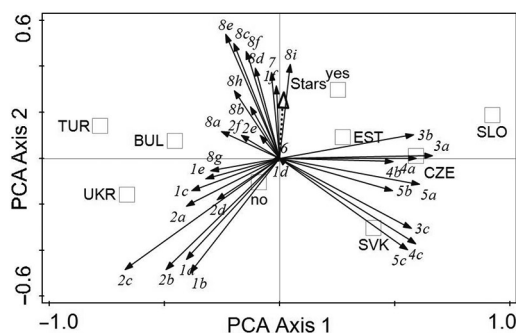


Figure 1 but plotted are the dependent variables (arrows with black point) and all independent variables (nominal variables are plotted as squares and ratio variables as arrows with larger white point). Along the first axis there are two groups of countries differentiated – on the left are Turkey, Ukraine, Bulgaria, on the right are Slovenia, Czech Republic, Slovakia and Estonia. The second axis is associated with the number of stars – the higher the number of stars, the greater positive score of the hotel is on the second axis. The affiliation with a hotel chain could also influence the position of hotel along the second axis – if the hotel is a member of a hotel chain, the score of the hotel is greater on the second axis. We tested for all independent variables, the correlation between scores on these first two axes and its original value, to find if there is a relation of those variables to ordination axes (Table III). The first axis significantly correlates with all countries except Estonia (Table III). Two groups of the countries are separated quite well along the first axis (Figure 2). The first consists of Turkey, Bulgaria and Ukraine; the second of Slovenia, the Czech Republic, Slovakia and (here not significantly) Estonia. Especially important is that Turkey completely differs along the first axis from Slovenia and the Czech Republic (Figure 3, Table II). The second Principal Component Analysis axis is overall of less importance and has lower pseudo-canonical correlation 0.341 with our independent variables (Table II, Figure 2). However, it significantly correlates with the number of stars of the respective hotel and the belonging to a hotel chain (Table II).

3.2 Null hypothesis testing

To test our hypothesis stated at the end of Section 1.3, i.e. to test the potential impact of each country on environmental practices in the hotel industry, we used partial redundancy analysis. Partial redundancy analysis was used as the number of stars as well the affiliation of a hotel to a hotel chain were found by principal component analysis and spearman rank order correlations as potentially influencing the complexity of environmental practices. The result of partial redundancy analysis is that – there is a statistically significant influence of the country on environmental practices (Table II, Figure 3). The first axis as well as the whole model is statistically significant (Table II). Especially, there is no overlap between



Notes: Dependent variables (black arrows with black point): 1-factors of motivation (1a-legislation; 1b-cost saving; 1c-competitiveness; 1d-green marketing; 1e-environmental protection; 1f-sustainability); 2 barriers (2a-implementation and maintenance costs; 2b-low return on investments; 2c-lack of financial sources; 2d-insufficient environmental awareness of hotel guests; 2e-lack of information sources; 2f-lack of knowledge and skills); 3-noticed initiative or support by government (3a-any initiative or support; 3b-information or education support; 3c-financial support); 4-noticed initiative or support by local government or municipality (4a-any initiative or support; 4b-information or education support; 4c-financial support); 5-noticed initiative or support by non-governmental organizations (5a-any initiative or support; 5b-information or education support; 5c-financial support); 6-influence of an available financial support on the willingness to implement environmental practices; 7-perception of legislation issues; 8-perception of importance of particular factors (8a-legislation intensifying; 8b-better information accessibility; 8c- environmental certification or EMS implementation costs; 8d-complicated environmental certification or EMS implementation process; 8e-environmental certification and EMS propagation; 8f-environmental awareness of hotel guests; 8g-extra financial funds or sources; 8h-competition on the market; 8i-green trend on the market). Dependent variables: Countries (BUL – Bulgaria; CZE – The Czech Republic; EST - Estonia; SVK – Slovakia; SLO - Slovenia TUR - Turkey; UKR – Ukraine); affiliation with a hotel chain (yes – member of hotel chain; no – not affiliated); Stars (the number of stars)

Figure 2.
Principal component
analysis ordination
biplot with position of
dependent and
independent
variables

Table III.
Spearman rank order correlations between independent variables and ordination axes of principal component analysis (PCA)

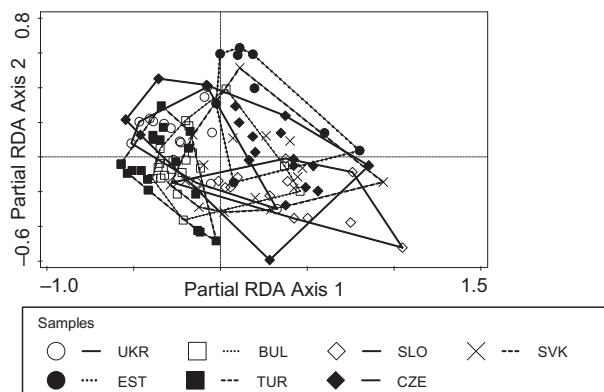
hotels from Turkey and Slovenia and between Turkey and Estonia. The centers of Czech and Slovakian hotels are close to Estonian center; on the other hand, the center of Ukrainian and Bulgarian hotels is closer to Turkey. Regardless of the quite small values of eigenvalues (Table II), the positions of countries in principal component analysis and in partial Redundancy Analysis are very similar (compare Figure 1 with Figure 3 and compare Figure 2 with Figure 4). Thus, “country” could be considered as really statistically important and as a reasonable factor of differentiation in environmental practices in the hotel industry among CEE countries.

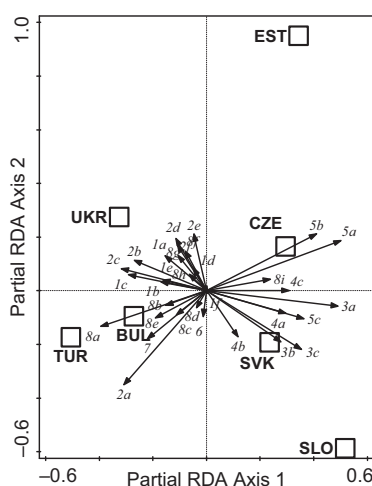
Two groups of the countries are formed in redundancy analysis (= are separate one from another along the first axis) – one group is formed by Slovenia, Estonia, the Czech Republic and Slovakia, and second group by Turkey, Ukraine and Bulgaria. If we look at the dependent variables in partial redundancy analysis biplot (Figure 4), we found that along the first axis the initiative and support of the government and local government are especially separated (the arrows of these dependent variables are oriented towards the first group) from the pressure of legislation, the role of competitiveness, perceiving the lack of financial resources, and a slow return on investments (the arrows of these dependent variables are oriented towards the second group).

	1st PCA Axis	2nd PCA Axis
TUR	−0.381***	n.s
UKR	−0.284**	n.s
BUL	−0.187*	n.s
SLO	0.317***	n.s
SVK	0.212*	n.s
CZE	0.265**	n.s
EST	n.s	n.s
Hotel grading (Stars)	n.s	0.303**
Hotel chain (yes)	n.s	0.192*

Notes: Significance levels; * is $p < 0.05$; ** is $p < 0.01$; *** is $p < 0.001$, n.s. – not significant

Figure 3.
Position of hotels classified according the country in plot of first and second redundancy analysis axes





appearing since 1989, during the transition period from a centrally planned economy to a market economy (Navratil *et al.*, 2018). EE countries may also tend to attract tourists by a certain exoticism (Verschaeve and Wadle, 2014) that would tail off adopting “Western” influences.

We have revealed what makes the difference between hotels in Central and Eastern Europe – perception of the initiative and support of government and local government, pressure from legislation, the role of competitiveness, lack of financial resources and slow return on investment.

4.1 Support of the government and pressure from legislation

Perception of the importance of public support to environmentally friendly accommodation is the most influential factor that determines the separation of the groups of countries along the first gradient. Since the 1980s, the international community has been taking steps to regulate tourism for sustainable outcomes (Jenkins and Mkono, 2015). It is possible to consider sustainability and environmental management as a hierarchy of policies and actions:

- global environmental policies;
- national environmental policies;
- responsibility of businesses; and
- local action.

In Kirk’s (1995) view, environmental problems must be tackled at all levels. He sees the importance of global and national policies and their support. Dief and Font (2010), on the contrary, find such policies ineffective.

Several policies generally concern the environmental management, not only those narrowly focused on hotels or tourism. The European Union – which has dealt with environmental protection issues at least since the 1970s (Bakos, 2017) – for example, has brought in a large number of Directives which relate to the management of the environment. Many of these were adopted as national policies in the 1990s. Likewise, legislation is mostly general; almost no specific regulation in the field of hotel operating or tourism has appeared (García-Pozo *et al.*, 2016). Member countries take actions individually and in different manners.

The Treaty of Lisbon (valid since December 1, 2009) recognizes tourism policy in relation to promoting competitiveness by encouraging a favorable environment for the development of undertaking and promoting cooperation between Member States. To stimulate the development of sustainable tourism, the European Union provides financial support to the entities from member countries. Moreover, a variety of nonprofit organizations that support sustainable, eco-friendly tourism has emerged across the European Union, including the European network of European Centre for Ecological and Agricultural Tourism – a leading European organization in the field of small-scale sustainable tourism.

4.2 The “Money” issue

The perception of financial aspects of introducing eco-friendly activities and “green” elements in hotel business operations is, next to public support, the second most important differentiation factor. Pro-environmental actions of hotels are generally linked with higher fixed costs and low return on investment, which are typical of the tourism and hospitality industry (Faulk, 2000). This low return on investment could be a stronger barrier in those countries, where hotels face higher price sensitivity and generally lower price level of

accommodation. Many hotels are unwilling to develop an international EMS because of the lack of resources and knowledge (Chan and Ho, 2006).

Going from the west to the southeast of Central and Eastern Europe, the sustainable practices and pro-environmental measures in accommodation establishments are more and more considered as too expensive (Ivanov *et al.*, 2014) and managers are more sensitive to the profitability of such measures (Erdogan and Baris, 2007; Dief and Font, 2010). This is bind with economic power of these countries. The price level in hospitality industry in Europe varies from 43 per cent to 186 per cent of the EU (28) average and all the CEE countries are below this average, Slovenia having the highest rank (Eurostat, 2018) and only Slovenia ranks among Eco-I leaders of the Eco-innovation index of the European Union 28 countries (European Commission, 2018). Environmental protection has become a top priority for national governments of the European Union member countries from Central and Eastern Europe since their entry – that is why the pro-environmental activities are more promoted there (Przychodzen and Przychodzen, 2015).

5. Conclusions

Based on multivariate analysis of many aspects of sustainability and environmental protection regarding hotel industry, we have found differences in perception of environmental practice implementation in different countries of Central and Eastern Europe. We have confirmed the influence of star rating level of hotels and hotels' affiliation with a hotel chain on perception of different aspects of adopting environmentally friendly practices in the hotel industry. We have also identified hotels' geographical position within Central and Eastern Europe as the far most important factor. However, this factor is not "geographical" in sense of position in coordinate system. Identified were two groups of CEE countries. The complexity of aspects of sustainability and environmental protection regarding hotel industry differs between CE countries and EE countries. Thus, the differentiation of the aspects mentioned above comes from the social and culture policies, company policies and business cultures between these two sub-realms. Pro-environmental actions are apparently promoted less publicly in EE countries than in CE countries. The reaction to the trend for demand of greener hotels is stronger in the West, and its hotels are more likely to have legislation requirements and public support as an incentive to adopt pro-environmental measures in their business operations.

5.1 Practical implications

The importance of the present study for adaptation of environmentally friendly practices in the hotel industry lies first in the identification of the aspects that are governed by geographical differences among the countries studied. These aspects are the initiatives and support from the government and the local governments, which counteract the perception that there is a lack of financial resources and the return on investments is slow. So, based on our data, which included information from various types of hotels from seven CEE countries, the activities of national and local authorities were identified to be the main differentiating variable. The support of the environment-friendly conduct of business in the hotel industry is appreciated by hotel managers from Central Europe. On the other hand, hotel managers from Eastern Europe do not feel any significant support from either national or other public institutions. The second factor of differentiation is represented by the perception of the lack of funds. Hotel managers from Eastern Europe feel strongly about funds limitation. The coherence of both those factors is obvious in the results, as they show the same direction but opposite orientation. It has already been discussed above.

Therefore, when looking at the results, we find the perception of availability of funds to be a fundamental difference between hotel management in Central Europe and in Eastern Europe. Implementation of environmentally friendly procedures is influenced particularly by the issue of finances, whereas any other aspects do not play an important role in differentiation of the approaches towards environmentally friendly hotels in CEE countries. The lack of funds is perceived more intensively in Eastern Europe than in Central Europe, particularly because of a stronger awareness of direct or indirect support for such activities by national and other public institutions in Central Europe.

As for the potential specific strategies or tactics, the most effective support for adopting the eco-friendly measures seems to be both public funding and non-governmental organization support. Strategic framework of public support for tourism, together with specific funding and support from local governments or encouragement of regional initiatives, such as Local Action Groups, represents a bottom-up effect on the development of environmentally friendly tourism (for instance in the Czech Republic and Slovakia). That support should be properly communicated to hotel owners and hotel managers who seem not to be always sufficiently informed. For example, environmental standards have been present for a long period of time, with the first national eco-labeling initiative that started already in 1992 (Erdogan, 2018) in Turkey, but developing an integrated system of policy and practice of environmental protection is still needed (Erdogan and Baris, 2007). Nevertheless, managers seem not to be aware of such initiatives (Dincer *et al.*, 2017).

5.2 Theoretical implications

We have laid aside all traditionally studied “factors” of pro-environmental orientation in the hotel industry – they were confirmed in our Principal Component Analysis and we have concentrated only on the phenomenon of “geographical” gradient in the structure of supporting aspects and barriers to development of environmental practices in hotels across Central and Eastern Europe. We have found that the “geographical” gradient exists and it is statistically significant – “geographical” in the sense of the existence of two different areas in Central and Eastern cultural realm.

A difference was proven in the structure of many aspects of pro-environmental orientation, including motivation, barriers and others. This finding is important for further studies dealing with different aspects of the pro-environmental orientation of hotels because the general environment-related establishment is strongly affected by the East-West gradient. Thus, each aspect of the pro-environmental orientation in diverse countries has its special position among other aspects. This gradient is guided particularly by the problems of financing pro-environmental measures, which could be caused by differences in economic power of the studied countries.

5.3 Limitations and further studies

Research was limited to a selection of CEE countries. There is still probability, that managers in hotels from Poland and Croatia could possess different preferences. Other limitation of our study is, that only special part of hotels were asked – hotels certified by star grading, out of our scope remained other hotels. It is also known that important factor is precise location of hotel within country – hotels in established tourism destination behave other way that those outside recreational areas. These factors deserve further study within this topic.

There are many aspects of sustainability and environmental protection regarding hotel industry. As we have found in our principal correspondence analysis, different environmental measures were different location in biplot – some were affected by country the other by star grading and affiliation to hotel chain. The complexity deserves to be studied in depth.

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Appendix. Measured items

- (1) Factors of motivation:
 - 1a-legislation;
 - 1b-cost saving;
 - 1c-competitiveness;
 - 1d-green marketing;
 - 1e-environmental protection; and
 - 1f-sustainability.
- (2) Perception of barriers:
 - 2a-implementation and maintenance costs;
 - 2b-low return on investments;
 - 2c-lack of financial sources;
 - 2d-insufficient environmental awareness of hotel guests;
 - 2e-lack of information sources; and
 - 2f-lack of knowledge and skills.
- (3) Noticed initiative or support by government:
 - 3a-any initiative or support;
 - 3b-information or education support; and

- 3c-financial support.
- (4) Noticed initiative or support by local government or municipality:
 - 4a-any initiative or support;
 - 4b-information or education support; and
 - 4c-financial support.
- (5) Noticed initiative or support by non-governmental organizations:
 - 5a-any initiative or support;
 - 5b-information or education support; and
 - 5c-financial support
- (6) Influence of an available financial support on the willingness to implement environmental practices
- (7) Perception of legislation issues.
- (8) Perception of importance of particular factors:
 - 8a-legislation intensifying;
 - 8b-better information accessibility;
 - 8c- environmental certification or EMS implementation costs;
 - 8d-complicated environmental certification or EMS implementation process;
 - 8e-environmental certification and EMS propagation;
 - 8f-environmental awareness of hotel guests;
 - 8g-extra financial funds or sources;
 - 8h-competition on the market; and
 - 8i-green trend on the market.

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