

University doctoral (PhD) dissertation theses

**INDICATORS AND INCENTIVES OF
ENVIRONMENTALLY CONSCIOUS BUSINESS
OPERATION**

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INTRODUCTION

In my PhD dissertation I apply an interdisciplinary approach to shed light on the important question of environmental management: which segments of companies and for what reason take environmental factors into consideration.

The actuality of my topic can be supported by the findings that the social assessment of environmental protection has been recently improved which overshadowed the orthodox belief that environmentalism ‘only’ increases the company’s expenses. Company leaders and managers have realized that through environmentally conscious manufacturing their competitiveness and market advantage can be increased. In the long run it can lead to growing company value as well. We can undoubtedly claim that we have reached a paradigm shift. As previously the focus on material value was replaced by Hedonism, which put the enjoyment of life as a first priority, we reached a new shift of values again, in which environmental consciousness lies in the core rather than overconsumption.

Nowadays with the rising economic competition, it has become obvious that a company can only be evaluated as a complex system rather than fragmented, the different fields separately. Environmental consciousness is part of the social responsibility of companies, therefore it is necessary for a company to be able to understand and clearly measure its effects on the environment. That is the reason why companies take the environmental factors into consideration and pay attention to their environmental performance.

The relationship between environmental and economic processes is very complex, hence their accurate modelling is hard to imagine by using natural data, evaluation has to be carried out by introducing qualitative indicators as well. Although many different views and methodologies exist for the measurement of corporate environmental performance, but no standardized, generally accepted and universal method has been developed. The goal of my PhD thesis is to give an answer to – with the help of qualitative environmental performance indicators that point beyond output orientation – (1) what kind of efforts Hungarian manufacturing companies make in order to preserve the environment, (2) what those corporate strategies are where the organizations can

synthesize their financial goals with the protection of the environment and furthermore
(3) what coordinating factors and motivational forces have an influence on the selection
of these techniques.

1. RELEVANCE AND OBJECTIVES

The aim of my dissertation is to find an answer to the question of to what extent environmentally conscious behaviour is a strategic factor. Related to this, the prime objective of my thesis is – as I have already mentioned before – to answer the main question that enquires which segments of companies take environmental factors into consideration and why.

The following hypotheses are addressed in the present research:

H1: The environmental orientation of companies is very diverse; based on their environmental performance, companies can be divided into significantly different homogenous groups, which indicate different environmental strategies.

The goal of my research is to find an answer with the help of qualitative performance indicators that point beyond the output-oriented perspective, what efforts do the manufacturing companies – that generally have the biggest impact on the environment – make on the strategic level to protect the environment.

After mapping the qualitative environmental performance of companies – which is a key factor of analyzing the corporate environmental relationship the most precise way – I am looking for the answer to which factors have a significant effect on the environmentally conscious business operation. Related to this task, the following hypothesis can be phrased.

H2: The characteristics and organizational attributes of companies perfectly determine their relationship to the natural environment.

Related to this hypothesis I set out to answer two sub-goals.

- ✓ To what extent do the corporate attributes influence the application of environmental management systems?
- ✓ How much do the characteristics of an organization influence the environmental efforts on a strategic level?

H3: Legislation facilitates a true „green” picture to be drawn, furthermore it improves the quality of environmentally conscious behaviour.

To determine the influencing power of the legislative process, first I studied the environment related provisions of the Act on accountancy, and henceforward I have answered the question: whether meeting the requirements of the legislation has an effect on the quality of environmental consciousness?

H4: Environmental management systems themselves improve the performance of companies.

In my PhD dissertation I apply an empirical method to study the effectiveness of Environmental Management Systems adopted by manufacturing companies represented in the research sample. Within this, I try to find out how the Environmental Management System supports environmentally conscious management.

H5: Only those companies can achieve improving environmental performance whose strategy is driven by both external and internal driving forces.

Within the theme of the effects of coordinating motivational forces, I also would like to answer two questions:

- ✓ What motives do companies have turning their attention to the natural environment?
- ✓ To what extent can environmental performance of the companies be improved?
When are environmental dimensions integrated into the strategy?

The dissertation aims at proving the above mentioned hypotheses and drawing further conclusions.

2. HISTORY AND APPLIED METHODS

The qualitative analysis of the results of environmental performance evaluation and the application of this to the state of the environment on a corporate level is a relatively new area of research. Torma (2007) and Bebes (2011) state that there were similar kind of studies in some countries of the European Union, but their practical application is still premature. In Hungary, these types of activities were only done in small groups so far consequently we have limited data availability. However the academic and practical potential make it necessary to carry out further research on this field.

Reviewing the related literature, I set the background for the topic of my research. In my dissertation, while describing and systematizing the closely related empirical literature and the results of secondary studies, I will introduce the most important views, ideas and methods related to environmental management and performance evaluation. Within this framework I pay special attention to the following:

- corporate environmental consciousness
- interpretations, aspects and influencing factors of environmental performance
- the role of environmental management systems
- the topic of environmental strategy

After the review of the empirical literature, the main part of my dissertation consists of own data collection and primary studies, which contribute to the more detailed and novel understanding of the above mentioned questions.

During my research I use three types of data sources: (1) the Company Information and Electronic Company Registration Service of the Ministry of Public Administration and Justice (Közigazgatási és Igazságügyi Minisztérium Céginformációs Rendszer), (2) information database of the Central Statistics Agency for sample selection, (3) data from own constructed questionnaire. I previously sent out a questionnaire, which I designed and edited myself, to the selected companies, so I was able to examine the environmental efforts of 82 Hungarian profit-oriented manufacturing companies. In my research I could not include the whole industry, I focus on manufacturing companies,

but because of their dominance of environmental strain, I think that conclusions I draw based on the sample are valid for the entire sector.

In order to assess the environmental protection efforts of firms I use four aggregated environmental indices on: **(1) environmental communication; (2) environmental knowledge, and learning; (3) environmental process** and **(4) environmental finances**. In the setup of the indices I strongly rely on the principles of the Balanced Scorecard and on the Boda-Pataki index-bouquet approach. As a combination of the two, along the four dimensions of the Balanced Scorecard, I will create the index that measures the quality of environmental consciousness, which is an improved version of the index-bouquet and serves as the baseline of the empirical research. My goal is to develop a kind of measurement system for environmental performance, which is able to take into account the physical and managerial information of a company and helps it to set and monitor the environmental goals and programmes. So that the above indices could really measure the environmental performance and facilitate the implementation of corporate strategies, they need further refinement and there is a need to show the physical strain on the environment of a company incorporated in them. Without these developments, the indices only measure and show the environmental orientation of the companies. In my thesis by using and improving the above introduced index-bouquet – incorporating output oriented questions also – I will measure the environmental performance of the companies. With this, the indices can be used to compare the environmental performance of the companies based on the questionnaires filled out by them.

By using these aspects, I will exceed the view that the environmental performance of the companies is only measured by physical indices. My methodology allows me to analyse environmental performance in a wider strategic context, which exceeds output orientation. Furthermore, thanks to the above mentioned amendments, I manage to avoid the difficulty of companies in many cases refusing to give answer to questions enquiring about the exact number of their strain on the environment.

Bearing in mind the nature of the collected data, for the purpose of processing the data in the research I use several types of applied statistical methods. On the one hand I use simple descriptive statistics, on the other hand more complex quantitative methods as

well, for example regression analysis, logistical regression and cluster analysis in order to process the required data.

I conduct the analysis of the questionnaires in Microsoft Excel 2007 and with the help of the SPSS 13.0 statistical software.

3. THE MAIN STATEMENTS OF THE DISSERTATION

3.1 Summary of findings from the critical literature review

The background of the research topic is presented in the literature that deals with the environmental aspects of strategic management and furthermore in corporate environmental performance evaluation.

➤ During the analysis of the relevant literature, I come to the conclusion that although there are many different views and methodologies and the means of applications vary on a large scale, no unified and generally accepted methodology has emerged. In many cases it is not only the way of the performance measurement that differs, but the understanding of the performance itself. Although corporate management acknowledges more and more the importance of protecting the environment and understands that in the long run the proactive handling of environmental affairs can lead to growing of company value, but the evaluation of environmental performance, which is needed for relevant managerial decisions, even nowadays, can still have obstacles in the way.

➤ While synthesising the literature it has been described that environmental factors can be taken into consideration in more areas of the corporate operation. In this context I pay more attention to the role of business management systems, where it can be stated that the different views based on secondary research – on the effectiveness of environmental management systems – comes from the different understanding of the systems themselves.

➤ Many studies have drawn attention to the commitment for green values of corporate managerial leadership and to the direct and solid commitment of the managers for protecting the environment. If the application of corporate management systems meets with the dedication of the leaders, it will lead to the integration of environmental principles into corporate strategy and through this to be the part of the mission of the company. All of these lead to improvement of the standard of environmental consciousness.

3.2 Indicators of environmental performance

The goal of the empirical research mapping the environmental performance of the companies is to find out how Hungarian companies are related to environmental issues in a strategic sense. I sum up the main findings of the research in the next section.

- It can be proved by the research that environmental performance is a multi-dimension phenomenon, which cannot be simply described by one or two easily identifiable indices. There are several minimum requirements that a company has to exceed to say that it operates in an environmentally friendly way.

- It is obvious that the investigation of physical indices, moreover the amount of toxic emission on a timescale and in natural units can be described as key factors; however they are not sufficient to evaluate the environmental performance of the companies. The output-focused indices are limited within a comparative approach, if we only use them, we will also lose the chance to compare more organizations.

- During the empirical research, the strategic indices that were selected and improved for the measurement of environmental orientation also include output oriented questions. With these amendments they really become suitable to measure the environmental performance of the companies in different dimensions and to give an analysis of their strategic operation. Without this revision the indices would only measure the environmental orientation of the companies. This kind of performance indicator is definitely complex, exceeds output orientation and it is in connection with the environmental abilities of the company.

In my thesis – based on the evaluated questionnaires – I will analyze the environmental performance of the companies along four aspects, which focus on the following organizational phenomenon and activities:

- ✓ **The dimension of environmental communication:** it shows how a company responds to environment related information and how much voice it gives to environmental orientation. This point of view enquires whether the positive impression of the customers about the company might leads to customer loyalty and satisfaction, by which competitive advantage can be achieved.

- ✓ **The dimensions of environmental knowledge and learning:** it measures how much the company thinks that the available intellectual capital is a significant factor of success; how much the company involves it during the execution of the environmental strategy to achieve its goals.
 - ✓ **The dimension of the environmental process** measures that how much the companies take the environmental factors and environmental interests into account during their every day routines; how important they consider the environmental factors in innovation, technology and during the development of products.
 - ✓ **The financial dimension of environmentalism** shows the exact effect of the easily measurable economic consequences following the decisions made. It expresses whether the company managed to achieve financial results with better environmental operation or not.
- With the help of the Cluster Analysis – along the chosen environmental factors – the companies can be classified into strongly distinct and homogeneous groups, called clusters. This is vital for the more precise mapping of the environmental relations of the companies.

Since the different corporate features and the organisational attributes do not improve the environmental performance indices consistently, it is presumable that the examined economic organisations – based on their different attributes – can be grouped along environmental indices. I carry out the grouping with the help of cluster analysis, and I examine each cluster upon what reasons and motivation they take the natural environment into account. The image – shown by the dendogram made with the within-groups linkage method – justifies mainly four, for the selection of the number of clusters. Thus the cluster analysis, made on four environmental performance indices, sort the sample of 82 manufacturing companies into four, basically different groups.

Table 1: The values of the clusters on different environmental performances

Cluster	Environmental studying index	Environmental communication index	Environmental process index	Environmental financial index	Applied environmental strategy
1	+	+	+	+	innovative
2	- / 0	+	+	+ / 0	defensive
3	0	+	- / 0	-	offensive
4	-	-	-	-	indifferent

+: above average, 0: near average, -: below average.

Source: own results

✓ The common feature of the companies in the first cluster is that they performed consistently well in all four dimensions of environmental performance examined by me. They achieved scores above the average in each index. Only a small range, 10% of the companies within the sample, belongs to this group. The companies of the first cluster are interlaced along two important factors beyond their consistently good performance. On one hand they perform significantly better than the rest in the field of environmental processes, on the other hand each company is obliged to hand an environmental annual report to the responsible authorities. It is important to emphasize this last factor, because it highlights the importance of environmental regulation and reveals the potential relationship between the properly defined regulatory environment and the environmental performances of the enterprises. These companies operate by using innovative environmental strategies; they try to turn the environmental product and technological improvements into competitive advantage. Consequently they increasingly integrate their environmental aspects into their innovative and communicational policies.

✓ The companies of the second cluster make up the largest group. More than 35% of the sample is concentrated here. These organisations are characterised by environmental communication and environmental progression indices which are above the average, according to the environmental financial index they seem to be average, while in regard to the knowledge index a great majority of them achieved results below the average, and only a small range of them are characterised by an average value. These enterprises are really similar to the first cluster in terms of their environmental orientation resulting in high environmental performance; however they did not

institutionalise, build the environmental factors into their organisational structure. It is obvious that the average headcount in year 2009 of these companies is less than the headcount of the companies in the first cluster and it ranges on a wide scale. A small business with 50 members and a large company which employs more than 1000 members can also be found in this cluster, while the companies in the first cluster without exceptions operate with more than 1000 employees. This not only confirms the positive relation between the organisational size and the environmental institutionalisation, but it also indicates that the higher level of the environmental orientation is not limited to the big companies. The application of the technological and production solutions that take into account the environmental needs can be beneficial for all the companies. The companies that belong to this group practice a defensive environmental strategy.

✓ One fourth of the sample companies are in the third cluster and their common feature is that they have reached a better than average score in the environmental communication index, while a mediocre one in the field of environmental knowledge and below the average in the environmental processes and environmental finances indices. The results of these companies show that they understand the importance of environmentalism, but do not pay enough attention to it. They gather and show information about the effects on the environment, but this is rarely paired with an organizational unit that is part of the whole structure and has the adequate competences. They only moderately, or not at all move the technology of their manufacturing towards environmental-friendly dimensions. It can be concluded that the companies in this category pursue an offensive environmental strategy.

✓ The fourth cluster is the second biggest group among the examined companies, because three tenth of the total number of companies are concentrated here. Companies in this cluster have below the average scores in all four dimensions of environmental performance. Beyond this, the majority of the answers for the questionnaire, even one by one, support the conclusion that these companies completely neglect environmental deliberation. Companies in this cluster pursue an environmentally inactive strategy. In this category, companies where the average headcount is less than 250 are overrepresented and it stands out that the state is not the majority owner in either of them.

➤ Based on the results of the qualitative evaluation of environmental performance, it can be said that the environmental orientation of the companies differs significantly along the lines of the strategic indices that were selected – and can be considered suitable by adapting the corporate characteristics – for the evaluation. Companies can be put into significantly different homogenous categories. Taking these aspects into consideration could be necessary and efficient at time of making environmental decisions. However, for the relevant managerial decisions, other factors which have an effect on environmental performance have to be integrated into the research. It calls for further research.

3.3 Incentives of environmental performance

After mapping the qualitative aspects of corporate environmental performance, I investigate what coordinating factors have an important influencing power on it. I examine four areas:

- the relationship between the performance indices and the main attributes of the companies,
- the power of legislation,
- the effect of environmental management systems,
- the strategic context of environmental management.

The relationship between the performance indices and the main attributes of the companies

Out of the corporate attributes and characteristics that were introduced in the description of the research sample, organizational size (quantitative feature) and the structure of ownership (qualitative feature), which are measurable on a proportional scale, proved to be of explanatory importance and to be a significant influencing factor in many ways in the context of the four environmental performance indexes.

The power of legislation

While reviewing the regulations of corporate environmental activity, we are faced with the fact that the rules of existing laws make it possible to show a reliable, real time "green" image, but not all companies make use of this.

Table 2: The distribution of environmental information based on the number and percentage of companies

	Number of companies (Pcs)	Distribution in percent (%)
Does not contain information	24	29,5%
Mentions, but does not deal with environmentalism	24	29,5%
Includes information about environmentalism	34	41,0%

Source: results

It was possible to show legislative adequacy with simple statistical methods from the examined reports, but they do not give an opportunity for deeper analysis, as comparability is not ensured. However, it can be a starting point that Act C. of 2000 on Accounting says that companies which do double-entry bookkeeping have to include data related to the environmental effects of their operation in the notes of their financial statement. From this perspective, it can be analyzed whether organizations which fulfil this obligation have better environmental performance or not than those, which come short of this task. Neither the Cramer (0.109), nor the Csuprov (0.098) associational indices shows considerable relation between the two variables. Both scores hardly reach 0.1, which indicates that the knowledge that a company includes data related to the environment in the financial statement does not influence the quality of environmental consciousness.

The effect of environmental management systems

Based on the research which analyzed the efficiency of the environmental management systems in the sample group of companies, it can be stated that although these systems can be looked at as the benchmarks of commitment towards environmentalism, they do not automatically make environmental performance better. These elements of

management do not make environmental performance better in themselves, but serve as a framework for direct environmental actions and ensure their continuity.

In the research it will be examined, in which of the four clusters – that were created based on the index groups that measure environmental performance – the usage of environmental management system is dominant. For analyzing this I apply a multinomial logistic regression model. In this analysis the attachment to a cluster serves as a dependent variable, while the independent variable is the application of the environmental management system. This can take two values: yes-no. The fact that neither of the companies in the fourth cluster use an environmental management system, which means that they have a worse than average environmental performance index, proves in itself that there is a relationship between environmental performance and the application of the management tool in question. While – without relevance – the representation of the fourth cluster is needless in the model, the dependent variable can take three values, from which the first cluster will be the reference category, so we compare the results of the other two clusters to the best performing one.

According to the model, statistics show that companies which use an environmental management system have significantly lower turn up chance in the second cluster than in the first one. This is a surprising result, because in practical terms, this means that companies which use an environmental management system deal with environmental factors on the organizational level in an institutionalized form as well. However the fact that there is no significant difference in the statistical sample group between the second and third group of EMS using companies, questions whether environmental management systems have an effect on effective environmental performance. This suggests that although the application of an environmental management system improves the institutionalization of the environmental position of an organization, it does not necessarily make environmental communication better, nor does it create a positive shift in environmental technology and towards environment focused operation. The result of all of these is that the explanatory power of the model is not very high, as based on the respective indexes of Cox and Snell, Nagelkerke, and McFadden, the existence of an environmental management system only explains 9-18% of the relationship to a cluster of environmental performance.

This means that besides and next to the application of the environmental management systems, other forces also influence the quality of environmental performance and even have a greater power. In the last part of my thesis I examine one of these coordinating factors that is considered to have a big impact, namely the role of the environmental orientation intensifying, motivational forces.

The strategic context of environmental management

With the help of the possibilities provided by the thesaurus of statistical methodology, I managed to identify those motivational factors, which have a significant influencing power on the environmental performance of the companies. Because of the complex relationships and associations of the economic sector, more than one economic operator has an effect on the environmental decisions of a company. Among these operators, the state has an outstanding role, which can by legislation and official tools help investments, methods and technologies that serve the interests of the environment and society, or sanction activities which are not desirable. Next to this, other actors are also able to put pressure on the companies.

As a result of the questionnaire based research, we can see that those companies are able to achieve good environmental performance, which are governed by external – legislative and regulatory – pressure and internal motivation as well and these together work the most towards improving environmental performance.

Motivating forces that inspire better environmental performance can be broken down into two groups, based on the inspiration coming from the outside, or inside the organization.

The internal elements contain the following factors:

- the expectations of the owners towards the environment,
- the managerial commitment of the company towards the environment,
- financial benefits coming from avoiding the strain on the environment and
- profit from the improvement of efficiency by the application of environmentally friendly technologies

The group of external motivation contains keeping the interests of

- state institutions,
- potential consumer groups,
- local society,
- and other groups (environmental groups, political parties, civil associations) in mind.

In the questionnaire, the companies had to rate the influencing power of these eight elements on a Likert-scale, from 1 to 5. In the fourth table, it can be clearly seen that the average of the ratings is the highest with the state owned organisations, or in other words, this element is the most influential one.

Table 3.: Motivating elements of environmental orientation

Motivational elements	Distribution of the scores, %					Score
	1	2	3	4	5	
	<i>Internal factors</i>					
Owners	7,3	37,8	25,6	20,7	8,5	2,9
Management	7,3	37,8	24,4	19,5	11,0	2,9
Financial profit	6,1	20,7	26,8	19,5	26,8	3,4
Technological efficiency	4,9	20,7	30,5	24,4	19,5	3,3
	<i>External factors</i>					
State institutions	2,4	17,1	20,7	29,3	30,5	3,7
Customers	8,5	25,6	24,4	31,7	9,8	3,1
Society	26,8	31,7	28,0	9,8	3,7	2,3
Other organisations	35,4	26,8	22,0	6,1	9,8	2,3

**The average of the scores (1=not important at all, 5=very important)*

Source: Self edited

By summing up the scores one-by-one given to the internal and external elements on the basis of importance, I examine the resulting two groups of sample companies using cluster analysis. I created the clusters using the within-groups linkage method again and it resulted in four sharply different groups of companies. In the first cluster of companies, impulses coming from both inside and outside play a big role in making environmental related decisions. This cluster covers the smallest group of the sample

with only 12%. The common feature of the companies which belongs here is that their average statistical headcount was at least 500 in 2009.

The second cluster is the biggest in numbers by concentrating 45% of the sample. In this group the companies consider external motivating factors more important than the average, but at the same time they mostly lack the need coming from inside of the company to improve environmental performance. Opposed to this, the companies of the third cluster rather pay attention to the natural environment governed by the inner motivations of their organisation, while outside elements have less than average influencing power on them. The state has an important role in the life of these companies also, but the power of other outside actors can nearly be neglected. The decisions of this group of companies are largely determined by efficiency and financial benefits that come from the application of environmental friendly technologies and these gains were rated higher than average by the companies of the third cluster. This group holds the 22% of the sample.

Those companies are put into the fourth cluster, which cannot be “forced” by either inner or external motivation to improve environmental performance. The eighteen companies, which are 22% of the sample, can only be affected by the state and the attempt to minimalise the financial loss from the strain on the environment (this can be considered an average in the sample), while towards any other mentioned aspect they are indifferent.

The created four clusters are useful to analyze if there is a connection between the type and level of environmental performance of the companies or not and what main motivating forces determine their related decisions. Based on the different attributes of the two cluster analyses – on environmental performance and on motivation – groups of companies were compared.

There was a big overlap in the sample between the two cluster groups: those companies which are influenced by both inside and outside motivation, performed above average in all four dimensions of environmental performance. This means that the first groups of the two differently distributed clusters correspond to each other, while the two clusters contain the same companies.

Those organisations that belong to the second of the environmental performance based clusters, so those which are characterised by above the average environmental learning, communicational and financial indices, typically shift towards environmental orientation because of internal motivating factors, even though they only perform averagely in environmental institutionalisation. The 86% of the sample items in this group come from the inside motivational ones.

Those companies are in the third cluster based on their environmental performance, which exceed the average of the sample in the field of environmental communication, but typically perform worse in the other indexes. 71% of the companies in this cluster are governed by external motivation and within this mainly the correspondence to state legislation is what forces environmental orientation out and therefore they pay more than average attention to environmental communication.

The companies which performed below average in all four aspects of environmental performance form the fourth cluster and 78% of them are indifferent to potential motivating factors coming from both outside the company, or inside the organisation. In other words, they feel no such force that could make them to achieve better environmental performance.

The research proved the assumption that out of the motivating factors, decisions and commitment coming from inside the organisation are able to improve the environmental orientation of the companies, can contribute to the implementation of the environmentally adequate technological and operational standards better than outside influencing factors. Opposed to this, the power of motivation coming from outside the company and within this the seemingly most important state regulations rather manifest themselves by forcing an environmental minimum on the participants of the market in a way that it creates a legislative environment where it is not worth “increasing company profit above everything else” while damaging the environment.

4. THE NEW AND NOVEL RESULTS OF THE DISSERTATION

The new and novel scientific results can be summarized as follows:

- 1. The research justifies that environmental performance as a multi-dimensional phenomenon, which makes it possible to classify the companies into separate homogenous groups with significantly different environmental strategies.**

With the help of the described indices, the most important dimensions that essentially characterize the efforts of the companies for the environment can be specified. Along the lines of the environmental indices, the companies can be put into significantly different, separate, largely homogenous groups, clusters, which imply different environmental corporate strategies.

- 2. With the help of a logistic regression analysis it can be proved that out of the typical corporate attributes, the size of the organisation and the structure of ownership is what significantly influence environmental performance and the use of environmental management systems.**

During the detailed research it is identified that the structure of ownership being mainly domestic or foreign does not show any important difference in environmental performance. This is an evidence that environmentalism is equally important for the representatives of the inner market as well. At the same time, the state owned companies show better environmental values, which can be traced back to being more dependent on the state and thus this external influence is greater than the average.

Out of the corporate attributes, the age of the company can be identified as a not influencing factor. Age of the company does not influence the application of environmental management systems and does not have a significant effect on environmental performance either. This is why the assumption is incorrect saying that in terms of lifecycles a mature company shows better environmental performance.

- 3. During the reviews of corporate environmental regulations and the analysis of the annual reports, it was justified that the current legislation makes it possible to show a reliable and true corporate "green" picture, but meeting the rules of the law does not influence the quality of environmental consciousness significantly.**

Most of the companies keep the legislation in mind to view their connections to the environment when creating the annual report, but a portion of the companies does not use the report to publish environmental information.

- 4. An obvious positive correlation does not seem to be visible between the adaptation of environmental information systems and improving environmental performance, the underlying relationship between the two is made obvious by motivational factors in the background.**

Environmental management systems do not improve environmental performance on their own, but serve as a framework for direct environmental actions and ensure their continuity.

- 5. It has been proven that the companies are able to achieve better environmental performance if they are faced with appropriate – legislative and regulatory – external pressure, while internal motivation also leads them and both of these together really improves environmental performance.**

The complexity of the relationships and connections of the business sector, corporate environmental decisions are influenced by many business personas at the same time. Out of the motivational factors, decisions and commitment coming from inside the organisation are more capable of improving the environmental orientation of the companies and also help to establish environmentally appropriate technologies and standards of operation more than the external influencing factors. Motivation coming from outside of the company and within this the seemingly most important state regulations rather manifest themselves by forcing an environmental minimum on the participants of the market in a way that it creates a legislative environment where it is not worth "increasing company profit above everything else" while damaging the environment.

5. THE PRACTICAL UTILITY OF THE RESULTS

My doctoral dissertation deals with the special subject of the integration of the environmental issues and the environmental views into the corporate governance.

For the leaders and the managers it becomes more and more obvious that the environmental cases, the protection of the environment does not only mean additional costs for the companies, but if a company recognizes the importance of environmental operation, it can easily gain advantages against its competitors in the market. Environmental operation is the possibility of long-term profitability, competitiveness and survival of a company and that is why the integration of it into the performance evaluating indicator number system becomes a vital factor of success.

The organisations have to recognise that for their performance evaluation they need such complex index numbers, number systems which beyond the financial point of view, can take other projections of corporate operation into consideration and give voice to them. Now we cannot say that there is a mature system for the disclosure of the environmental information, though the decisions made by the leaders can only be accurate if they are based on correct information and data. The aim of the environmental performance evaluation on any level of the economy is to ensure as accurate source data as possible, so that is why it is of outstanding importance that there are such tools and methods which are appropriate for the tasks and are able to satisfy this need. The index group shown earlier serves as an alternative for the foundations of an index number system which in the long-run can lead to the implementation of the Balanced Scorecard within a company, created by the further development of the Balanced Scorecard (BSC) worked out by Kaplan-Norton (2000). With the application of the Balanced Scorecard it becomes obvious for the companies that the attempts for sustainability are relevant and support business successes.

The identification of the important factors affecting the performance helps the corporate management to understand that the environmental measures in the long-run really lead to increase company value. These factors have to be taken into account during the relevant decision making and management control has a great role in this. As a

suggestion for the environmental performance evaluation it can be said that the range of the environmentally conscious companies can noticeably increase if the environmental orientation of the corporate management gets better and the need for environmental orientation emerges from inside the company. In my point of view the economic decision makers during their decisive process, for the most effective achievement of their aims, should take the environmental attitudes of the affected stakeholders and their relations to the environment into consideration. My thesis attempts in reference to the Hungarian manufacturing sector to map this by identifying the qualitative environmental performance indices that exceed output orientation and their incentives.

PUBLICATIONS IN THE DISSERTATION'S TOPIC AREA

PRIORITY PUBLICATIONS ACCORDING TO THE REGULATIONS OF THE DOCTORAL SCHOOL

Accepted publications by the Hungarian Academy of Sciences – Section of Economics and Law - including sociology, demography and political sciences

„D” category foreign periodical:

1. **Nagy Gábor** (2013): Umweltcontrolling. In.: Controller Magazin, Verlag für ControllingWissen AG, No. 02/2012., 85-87. pp.

“B” category Hungarian periodical:

2. **Nagy Gábor** (2013): Környezettudatos menedzsment eszközök alkalmazása és a vállalatok környezeti teljesítménye közötti kapcsolat. In.: Vezetéstudomány (forthcoming)

“D” category Hungarian periodical:

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