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IMPACT OF MOTIVATION AND BARRIERS ON THE BENEFITS OF THE IMPLEMENTATION OF AN ENVIRONMENTAL MANAGEMENT SYSTEM

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INTRODUCTION

Relevance of the topic. Environmental Management Systems, which include the ISO 14001 framework and the Eco-Management and Audit Scheme (EMAS), could be classified as a very important component of corporate strategy across companies within the European Union, as one of the goals set up by the European Commission on its Europe 2020 strategy is related to climate change and energy, where one of its main objectives is to reduce greenhouse emissions by 20% compared to the levels of the year 1990 (European Commission, 2017). However, the Europe 2020 strategy is a reference framework itself (European Commission, 2017), therefore, the European Union require the active participation of its member states and of the private sector on initiatives that reduce the greenhouse emissions to be able to achieve the targeted reductions.

Practical and theoretical value of the topic. In order to achieve the goal of greenhouse emissions reduction, companies could opt for implementing Environmental Management Systems such as the Eco-Management and Audit Scheme or the ISO 14001 framework. For instance, one of the main component of the Eco-Management and Audit Scheme is the greenhouse emissions reduction (European Commission, 2012). However, the implementation of these schemes is voluntary, and it is possible to consider that companies do not have enough motivation to implement them. As companies that adopted one of these Environmental Management Systems were not able to perceive any kind of competitive advantage after its implementation (Iraldo et al., 2009); moreover, from a financial point of view there was not any kind of benefit related to the implementation of Environmental Management Systems (Watson et al., 2004). These kinds of negative results could hinder the implementation of Environmental Management Systems, which in turn could impact the achievability of the greenhouse emissions reduction set up by the European Commission.

In some cases, previous research has shown benefits related to the implementation of Environmental Management Systems, for example, improvement of companies' financial results is related to the implementation of these systems (Sinkin et al., 2008; Horváthová, 2010). Furthermore, improvements were not limited to the companies' finances, as there was improvement in other aspects such as customer loyalty and firm image (Lankoski, 2007). If more studies are able to prove the benefits of the implementation of these environmental schemes, it could be possible to motivate more companies into adopting these.

Lithuanian total greenhouse emissions, including households and economic activities, account only for approximately 0.5% of the total greenhouse emissions within the European

Union (European Commission, 2014). Moreover, according to ISO (International Standard Organization), there were 668 companies with the ISO 14001 certification in Lithuania as of 2016 (ISO, 2017). Moreover, according to the European Commission, as of 2017, 4 companies in Lithuania have the Eco-Management and Audit Scheme certification (European Commission, 2017). However, due to these facts, it could be not possible to apply most of the previous studies related to the implementation of Environmental Management Systems to the specific case of Lithuania, as most of the researches conducted in the European Union about this topic are usually focused on countries that usually have a large number of companies that have implemented an Environmental Management System such as Italy or Spain.

Motives for choosing the particular topic. This research was chosen due to the importance given by the European Commission to greenhouse emissions reduction and the usefulness, for the European Union and companies, of implementing Environmental Management Systems in order to be able to achieve this goal. It was also chosen because of the contradictory results showed in previous research. Lithuania was chosen as the only country as studies in this field have been rarely conducted in the country and because some of the previous conclusions could not be applied to the country's industry. Therefore, the value of this research, from a theoretical point of view, is related to the academic insights related to the motivation, barriers and benefits of implementing Environmental Management Systems in Lithuania. Moreover, from a practical point of view, the results could help identify alternatives to promote the implementation of such management systems as companies could have some clearer expectations in regards of the barriers that they will face during the implementation and the benefits that they will perceive after its implementation.

The research object for this study is the impact of the motivations that lead companies in Lithuania to implement an Environmental Management System, and the impact of the barriers found by these companies during the implementation process, on the benefits perceived after the implementation of such management systems, therefore Lithuanian companies that are certified, either in ISO 14001 or in the Eco-Management and Audit Scheme or in both Environmental Management Systems, will be included in this research.

The aim of this research is to determine the extent of the impact of the motivations to implement an Environmental Management System, as well as of the barriers perceived during the implementation process of such management systems, on the benefits perceived by companies after implementing an Environmental Management System.

Goals:

1. To identify the main motivations that drive companies in Lithuania to implement an Environmental Management System.
2. To identify the main barriers that Lithuanian companies face during the implementation of an Environmental Management System.
3. To identify the main benefits that companies in Lithuania perceive after implementing an Environmental Management System.
4. To determine if the motivations to implement an Environmental Management System impacts the perceived benefits after its implementation.
5. To determine if the barriers encountered during the implementation of an Environmental Management System impacts the perceived benefits after its implementation.

Research methods. Two research methods will be used. The first one is an empirical method, specifically the survey, will be used to gather the primary data required for this research. It is important to note that the specific research instrument that will be used for this survey is a closed-ended Likert scale questionnaire. The second research method that will be used during this research is a regression analysis, as the answers from the respondents will be analyzed through this method in order to be able to determine the impact of motivations to implement an Environmental Management System and the barriers encountered during the implementation process on the benefits perceived after the implementation of these kind of systems.

The main limitation identified for this research, is that there is a low amount of companies that have implemented an Environmental Management System in Lithuania, especially regarding the Eco-Management and Audit Scheme certification, as only four companies in Lithuania have implemented this standard (European Commission, 2017), therefore, in this research, it will be not possible to differentiate results according to the Environmental Management System that each company has implemented as the results from companies that have either the ISO 14001 certification and the Eco-Management and Audit Scheme will be merged into a single group for analysis purposes.

Key literature used. For this research project, a total of fifty-three sources were used. Among these, 86,79% of the sources, a total of forty-six, are academic articles. All of these articles were extracted through Google Scholar. The remaining 13,21% of the sources are websites, of which five of the sources are related to information provided directly by governmental organizations, specifically the European Commission and the Government of the

Republic of Lithuania. One of the remaining websites used as a source is from a non-governmental organization, specifically from the International Organization for Standardization (ISO), whereas the last remaining source is the corporate website of the online survey tool used during this research (Zoho Survey).

The work structure is composed of three main segments, the first one is related to the literature review, which is composed of composed of four-sub segments, overview of Environmental Management Systems, review of motivations to implement an Environmental Management, review of barriers encountered during the implementation of an Environmental Management System and review of benefits perceived after the implementation of an Environmental Management System. The second segment consists int the design of the empirical research, which is composed of the following three sub-segments: research question and research model, research goal and sample, and research methodology. The third segment consists of two sub-segments, the first one is composed of the descriptive analysis of the empirical research's results, which includes the descriptive analysis of the research's results about motivation, benefits and barriers to implement an Environmental Management System, and descriptive analysis of the research's respondents, whereas the second sub-segment consists in the set of tests used in order to test the research's hypotheses.

1 REVIEW OF LITERATURE ON ENVIRONMENTAL MANAGEMENT SYSTEMS, MOTIVATION, BENEFITS AND BARRIERS

1.1 General Overview of Environmental Management Systems

One of the core objectives of Environmental Management Systems is to help organizations minimize the environmental impact generated by their activities (Arena et al., 2012; Cotoc et al., 2013; Campos et al., 2015). Environmental Management Systems such as ISO 14001 and the Eco-Management and Audit Scheme have been available in the European continent for more than 15 years (Neugebauer, 2012). However, it is important to note that while ISO 14001 is an international standard, the Eco-Management and Audit Scheme is focused on the European Union (Cotoc et al., 2013).

Both environmental standards have a similar structure and the implementation of these standards is voluntary (Fikru, 2014). However, it is important to note that the levels of environmental performance required by the ISO 14001 are equal to the ones stated by the local law where a company operates (Comoglio & Botta, 2011). Meanwhile, the Eco-Management and Audit Scheme requires a level of environmental performance higher than the one required by the local law where a company operates (Neugebauer, 2012; Cotoc et al., 2013).

As of 2016, there were 346.189 companies around the world that have the ISO 14001 certification, an increase of 8% compared to the amount of certified companies in 2015. Among the total certified companies, 34.84% of these are located in Europe. When it comes to amount of certified companies, the top three countries in Europe are Italy with 26.665 certified companies, followed by the United Kingdom with 16.761 certified companies, and Spain with 13.717 certified companies. In the specific case of Lithuania, the country had 668 certified companies as of 2016 (ISO, 2017).

As of April, 2017, the total amount of companies that have the Eco-Management and Audit Scheme is 3.963. Among the European Union members, the countries that have the biggest amount of certified companies are Germany with 1.251 companies, followed by Italy with 990 certified companies, and Spain with 869 certified companies. In the specific case of Lithuania, the country had 4 certified companies as of 2017 (European Commission, 2017).

Explained in a relative brief way, in order that companies are able to successfully implement an Environmental Management System, they must start by assessing the environmental impact caused by their activities, afterwards the company has to determine goals related to the reduction of their environmental impact, and as a final step, companies have to

develop plans that are useful in to their goals of reducing the environmental impact (Djekic et al., 2014).

1.2 Motivation to Implement Environmental Management Systems

There is a positive relationship between the level of socio-economic development, particularly less developed European Union Nations, and an increased interest to implement an Environmental Management System, particularly the ISO 14001 standard (Fura & Wang, 2015). However, other findings (Daddi et al., 2015) suggest that there is no relationship of the level of development of a nation and the increase of each nation in the adoption of the ISO 14001 standard, as the variable that has the main impact on the increase in the adoption rate of this standard among nations is their level of economic development. Therefore, taking into account the contradictory results regarding the relationship between the level of socio-economic development and the interest to implement an Environmental Management System, it could be possible that there is an additional variable among nations besides their level of socio-economic development that influences the motivation of companies to implement this kind of systems.

Motivation among developed economies

From the literature review, while it was not possible to identify a definitive consensus regarding the motivation of companies operating in European Union developed nations to implement an Environmental Management System, it is possible to identify various similarities in the motivation to implement these management systems among companies from different countries. For instance, the most important reason for the implementation of the ISO 14001 standard among Italian and Polish companies, was that the companies desired to have a socially responsible behavior (Kudłak, 2016; Murmura et al., 2018). Moreover, improvement of environmental performance was the main reason for Italian companies belonging to the country's metal industry (Arena et al., 2012), which could arguably be classified also as a socially responsible behavior. Moreover, the second most important motive to implement the ISO 14001 standard among Italian and Polish companies is related to the improvement of the company's corporate image (Arena et al., 2012; Kudłak, 2016; Murmura et al., 2018). Regarding the Eco-Management and Audit Scheme, the motivation to implement this scheme among Spanish companies was also related to socially responsible behavior and improvement of the company's image (Álvarez-García & del RíoRama, 2016). However, the most important reason behind the implementation of the Eco-Management and Audit Scheme among Italian companies, was the improvement of the company's corporate image, followed by legal

compliance as the second most important motive (Murmura et al., 2018). These conclusions could mean that there is a difference in the motivation to implement either the ISO 14001 standard or the Eco-Management and Audit Scheme, however, more research would be necessary in order to discard if there's another variable such as industry which could be impacting the motivations to implement an Environmental Management System.

The results from researches conducted in developed Asian nations such as China and Japan point out mostly to different motivation to implement Environmental Management Systems in comparison to the motivation of companies in European Union developed nations, however, it is important to note also that in some cases, some contradictory results were found. For instance, pressure from external stakeholders, particularly foreign customers, was the main reason why Japanese manufacturing companies decided to implement the ISO 14001 standard (Nishitani, 2009). Foreign customers were also the main reason to implement the ISO 14001 in China, however, and foreign investment was not a relevant reason to implement said standard (Qi et al., 2011). However, different researches identified foreign investment as the main reason to implement the ISO 14001 standard among Chinese companies (Qi et al., 2013). These differences among developed nations could point out the possibility of an additional variable, perhaps such as specific industry where the company operates, that has an impact on the reasons to implement an Environmental Management System.

Motivation among the Baltic States

The motivations to implement an Environmental Management System is different among the Baltic States. For instance, the main motivation for Latvian construction companies to implement an Environmental Management System was to improve their public image (Tambovceva & Geipele, 2011), meanwhile, the principal motivation for Estonian companies to implement the ISO 14001 standard was related to law and regulatory compliance, while improvement of the company's public image was considered the third most important factor (Gurvits & Habakuk, 2016). Due to the differences regarding the scope of the researches, construction sector (Tambovceva & Geipele, 2011) versus all economic sectors (Gurvits & Habakuk, 2016), it could be possible to conclude that the economic sector in which a company operates has certain level of influence on the motivation to implement an Environmental Management System, however, due to the limited sample size, more research would be necessary to determine if this variable has any kind of impact on the motivation to implement such management systems.

Motivation among developing economies

Among developing nations, the motivation to implement environmental management systems is influenced both the country's culture and the industry to which the company belongs to (Fikru, 2014). Nonetheless, it was possible to identify certain similarities in the motivation among certain developing countries, for instance, the most important reason to implement an Environmental Management System among Malaysian, Saudi Arabian and Turkish companies was related to the improvement of the company's corporate image (Agan et al., 2013; Mariotti et al., 2014; Salim et al., 2017). In contrast, according to the conclusions published by each author, the second most important motivation in these nations differ completely from each other. In the case of Saudi Arabia, the second most important reason to implement an Environmental Management System was related to legal compliance (Mariotti et al., 2014). While among Malaysian companies, the second most important reason was related to improvement of Environmental Performance (Salim et al, 2017). For Turkish's companies, the second most important motive by was related to strengthening of the company's brand name (Agan et al., 2013). On the other hand, the motivations to implement an Environmental Management System in companies from other developing nations differed completely from these reasons stated previously. For example, in Russia, the reasons to implement an Environmental Management System are related mostly to requirements by overseas markets, and secondly, to opportunities detected by management to obtain economic efficiencies after implementing one of these management systems (Crotty & Rodgers, 2011). Meanwhile, the most important reason for implementing Environmental Management Systems in Thailand is related to foreign direct investment (Tambunlertchai et al., 2012).

1.3 Barriers to implement an Environmental Management System

Financial Barriers of the implementation of an Environmental Management system

One of the main barriers that companies will find when they decide to implement an Environmental Management System, particularly the ISO 14001 standard, is related to the costs of the implementation itself, as companies consider that the costs of implementation and certification are high (Schylander & Martinuzzi, 2007; Turk, 2009; Martín-Peña et al., 2014; Mariotti et al., 2014; Boiral et al., 2016). As a reference, the average cost of implementing the ISO 14001 standard in Latvia, including set-up, consultant and certification costs, is approximately 11.943 Euros (Tambovceva & Geipele, 2011), while in Austria, the cost of implementation of this standard, including the same three concepts mentioned previously, is on

average 76.127 Euros (Schylander & Martinuzzi, 2007). Moreover, the cost barrier is not limited only to the implementation process, as companies also reported an increase in operational costs after the implementation of these standards (Turk, 2009; Murmura et al., 2018). Furthermore, considering that certain companies reported that they have the feeling that the benefits of the implementation of these standards are not guaranteed (Mariotti et al., 2014), and also that certain companies consider as a barrier the fact that they do not know the benefits stemming from the implementation of Environmental Management Systems (Salim et al., 2017), it could be argued that some companies are opting not to implement such systems or just opting to implement it without obtaining the certification, as these additional costs could be interpreted by them as opportunity costs.

Human Resources Barriers of the implementation of an Environmental Management system

A second category of barriers identified throughout the literature is related to the human resources component, for instance, one of the main barriers for companies implementing these kind of management systems was the lack of commitment from the staff (Mariotti et al., 2014; Martín-Peña et al., 2014; Álvarez-García & del RíoRama, 2016; Murmura et al., 2018). Moreover, lack of commitment from top management during the implementation process was also identified as a barrier for implementing an Environmental Management System (Mariotti et al., 2014; Martín-Peña et al., 2014; Álvarez-García & del RíoRama, 2016; Salim et al., 2017). Likewise, besides commitment barriers, one of the barriers for the implementation of these management systems is related to developing the appropriate competencies on the staff in order to be able to successfully implement these management systems (Mazzi et al., 2016; Salim et al. 2017). It is important to note that previous experience with the implementation of quality standards such as ISO 9001 allows companies to develop competencies which would be also required for the implementation of an Environmental Management System, thus reducing the impact of the barrier related to lack of competencies in the staff (Psomas et al., 2011). Moreover, quality management practices not only reduce the impact of the barrier related to lack of competencies in the staff, but are also a required driver in order to obtain benefits from the implementation of an Environmental Management System (Wiengarten & Pagell, 2012).

Operational Barriers of the implementation of an Environmental Management system

From the literature review, it was possible to identify a third category of barriers that impact companies when they opt to implement Environmental Management Systems, said category is related to operational factors. For instance, one of the barriers mentioned by companies is related to the amount of documentation required in order to implement an Environmental Management System (Mariotti et al., 2014; Boiral et al., 2016). Moreover, companies also consider the complexity of the implementation of an Environmental Management System itself as a barrier (Martín-Peña et al., 2014; Murmura et al., 2018). Besides, the complexity barrier is not only present during the implementation of an Environmental Management System, as after the successful implementation of these systems, some companies considered that the corporate procedures became increasingly complex (Murmura et al., 2018). Despite the fact that these types of barriers are not as common in the literature as the financial and human resources ones, as perhaps they could be also related to companies who did not had any previous experience with implementation of quality management systems, is it also relevant to include these type of barriers as variables in the research.

As a recap, from the information obtained throughout the literature review, it was possible to identify three types of barriers that companies could encounter while they are implementing an Environmental Management System. These were classified according to the company's aspect that is being impacted. The first barrier are financial ones, which is mainly related to increase in costs or the cost of the implementation itself. The second barrier is related to human resources, for example lack support from staff and top management. The final barrier, operational barriers, are related mostly to the processes that the company has to complete in order to be able to implement one of the Environmental Management Systems.

1.4 Benefits of the implementation of an Environmental Management System

Intangible Benefits from the Implementation of an Environmental Management System

There appears to be a general consensus regarding the intangible benefits stemming from the implementation of Environmental Management Systems. For instance, one of the main benefits perceived by companies that implemented these kind of management systems is the improvement of the company's corporate image (Schylander & Martinuzzi, 2007; Turk, 2009;

Psomas et al., 2011; Arena et al., 2012; Prajogo et al., 2012; Tambunlertchai et al., 2012; Djekic et al., 2014; Martín-Peña et al., 2014; Mariotti et al., 2014; Ong et al., 2016; Boiral et al., 2016; Salim et al., 2017). Another intangible benefit is the improvement of relationships with stakeholders (Gavronski et al., 2008; Murillo-Luna & Ramón-Solans-Prat, 2008; Arena et al., 2012; Martín-Peña et al., 2014). Moreover, increase of employee awareness related to environmental issues has been reported as a benefit by companies, as the employee awareness magnifies other benefits such as reduction of resource consumption and reduction of waste during operational processes (Schylander & Martinuzzi, 2007; Turk, 2009; Tambovceva & Geipele, 2011; Nguyen & Hens, 2013; Murmura et al., 2018).

This consensus related to the intangible benefits obtained from the implementation of Environmental Management System could be explained by the motivations that companies have to implement such systems, because the type of benefits obtained by companies is related to the motivation that the company had when they decided to implement these management system (Prajogo et al., 2012; Álvarez-García & del RíoRama, 2016), and as pointed out on the motivation segment, one of the most common motivation to implement an environmental management system is related to improvement of the company's corporate image.

Operational Benefits from the Implementation of an Environmental Management System

Among the operational benefits stemming from the implementation of an Environmental Management System is related to legal compliance related to the local laws where a company operates (Tambovceva & Geipele, 2011; Nguyen & Hens, 2013; He et al., 2014; Mazzi et al., 2016; Gurvits & Habakuk, 2016; Murmura et al., 2018). Another operational benefit is improvement of companies' environmental performance, which is associated with aspects such as minimizing pollution during companies' operational processes (Schylander & Martinuzzi, 2007; Turk, 2009; Arena et al., 2012; Nguyen & Hens, 2013; Djekic et al., 2014; Ferrón-Vílchez, 2016; Salim et al., 2017; Murmura et al., 2018).

Likewise, reduction in resource consumption, such as water and energy, is another benefit derived from the implementation of an Environmental Management System (Padma et al., 2008; Murillo-Luna & Ramón-Solans-Prat, 2008; Tambovceva & Geipele, 2011; Martín-Peña et al., 2014; Boiral et al., 2016). This reduction in resource consumption, plus the increase in productivity (Gavronski et al., 2008) and the reduction of waste during operational processes, such as transportation and manufacturing, perceived by companies after implementing an Environmental Management System (Tambovceva & Geipele, 2011), would lead to think that

there is a cost reduction derived by the implementation of Environmental Management Systems (Schylander & Martinuzzi, 2007; Martín-Peña et al., 2014; Ong et al., 2016). However, some companies perceived that there was no cost reduction stemming from the implementation of these management systems (Gurvits & Habakuk, 2016), while other companies actually perceived that there was actually an increase in costs derived from the implementation of an Environmental Management System (He et al., 2015).

The difference in the evaluation of costs could be explained by different factors, first of all, it is considered difficult to quantify the benefits derived from the implementation of Environmental Management Systems (Mazzi et al, 2016). Moreover, it would also be pertinent to evaluate the size of the companies that participated in the previous researches, as smaller companies obtain less benefits from the implementation of Environmental Management Systems compared to medium and large companies (Martín-Peña et al., 2014; Murmura et al., 2018). Similarly, it would be important to research if the companies that decided to participate in the previous researches had an adequate change management process during the implementation of the Environmental Management System, as there is a positive relation of change management with the improvement of environmental performance related results derived from the implementation of these management systems (Ronnenberg et al., 2011). Furthermore, it would be interesting to review the motivation of each company to implement an Environmental Management System, as for companies whose main motivation from implementing these systems is related to improvement of corporate image do not necessarily perceive performance related improvements, which in turn lead to decrease in the confidence of the standard (Ferrón-Vílchez, 2016).

Financial Benefits from the Implementation of an Environmental Management System

In regard to financial benefits derived from the implementation of Environmental Management Systems, this is where most of the authors who have researched the topic present the biggest amount of contradictory results. Some companies have perceived financial benefits after implementing an Environmental Management System (Lankoski, 2007; Murillo-Luna & Ramón-Solans-Prat, 2008; Sinkin et al., 2008; Horváthová, 2010; Lo et al., 2011). However, some companies have not perceived any financial gains after implementing such systems (Watson et al., 2004; He et al., 2015).

A possible explanation for these differences related to obtaining financial benefits after implementing an Environmental Management System is that efficient companies have a bigger

tendency to eventually implement such systems, thus generating the denominated “selective effect”, in which it seems that those companies are obtaining financial benefits from the implementation of these systems, but it is actually due to their efficiency (Heras Saizarbitoria & Arana Landín, 2011). Therefore, similarly to the operational benefits, it would be necessary to determine the companies’ characteristics in order to be able to corroborate if the financial benefits are indeed related to the Environmental Management System implementation.

Country-Specific Benefits from the Implementation of an Environmental Management System

Throughout the literature, the have been benefits pointed out by various researchers, that although could arguably be classified among intangibles, operational or financial benefits, seem to be more related to specific countries, or for countries with similar characteristics. For instance, one of the benefits of implementing these kind of management systems in China was the possibility to access foreign markets (He et al., 2015). Similarly, one of the main benefits that companies received in Malaysia is related to tax reliefs (Salim et al., 2017). Moreover, the implementation of an Environmental Management System was perceived by companies as a source of competitive advantage, particularly when companies respond to tender requests or when they participate in bidding processes, in Greece, Estonia and Malaysia (Psomas et al., 2011; Gurvits & Habakuk, 2016; Ong et al., 2016). Although it is possible that none of these benefits are perceived by companies in Lithuania, it would be important to review if the companies in this nation perceive any country-specific benefits derived from the implementation of these kind of management systems.

To summarize, according to the information obtained throughout the literature review, it was possible to classify the benefits that companies could receive after they have successfully implemented an Environmental Management System according to the company’s aspect that is being benefited. The first type of benefits are the intangible ones, which, as its name implies, are more complicated to measure exactly, like for example the actual increase in a company’s corporate image. The second type of benefits are operational ones, which refer mainly to improvement of processes within the company stemming from the implementation of these systems. The final type of benefits are the financial ones, which refer mostly to improvement at the company’s bottom line.

2 RESEARCH METHODOLOGY OF THE MOTIVATIONS, BENEFITS AND BARRIERS OF IMPLEMENTING ENVIRONMENTAL MANAGEMENT SYSTEMS

2.1 Research Questions & Research Model

Based on the literature review conducted during Research Project I and the information that was possible to gather through it, in order to conduct the research, the following research questions were formulated:

RQ1: What are the main motivations of Lithuanian companies to implement an Environmental Management System?

RQ2: What are the main barriers found by Lithuanian companies when implementing an Environmental Management System?

RQ3: What are the main benefits perceived by Lithuanian companies after implementing an Environmental Management System?

RQ4: Is there an impact caused by the motivation to implement an Environmental Management System on the benefits obtained after its implementation?

RQ5: Is there an impact caused by the barriers encountered during the implementation of an Environmental Management System on the benefits obtained after its implementation?

Based on the research questions and the information gathered throughout the literature review conducted during Research Project I, the following research model was constructed:

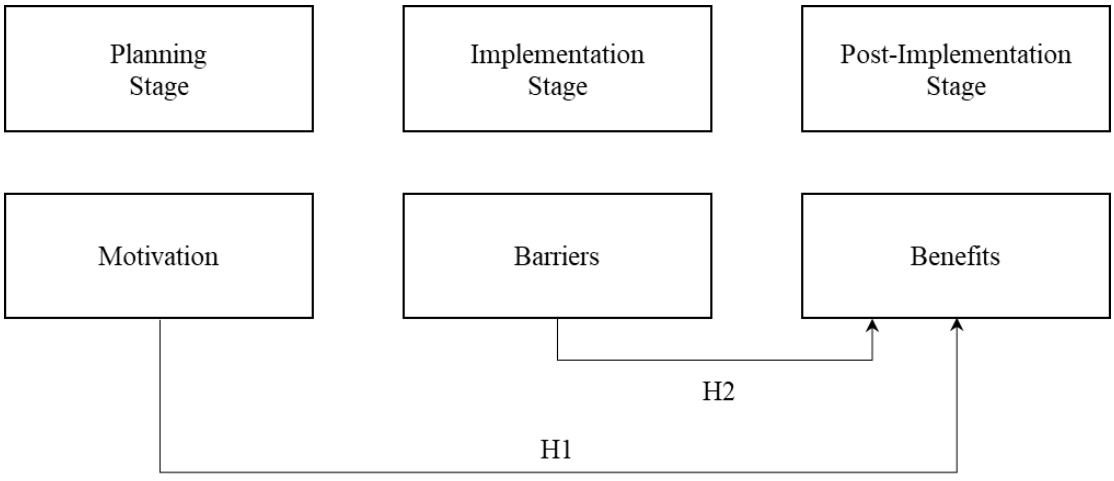

Figure 1. Research Model

(Source: author)

The research model was designed taking into account some of the stages of the implementation of the Environmental Management System, specifically the planning, implementation and post-implementation stages. Each one of the main components of this research - motivation, barriers and benefits - were associated with one of these stages according to the moment during the implementation where each component is more prevalent. Therefore, the motivation to implement an Environmental Management System was associated to the planning stage, as the motivations are the component that arguably lead to the start of the implementation process itself. Secondly, the perceived barriers were associated with the implementation stage, as during this stage companies would perceive the majority of barriers analyzed throughout the literature review, excluding some barriers such as increase in operational cost after the implementation of an Environmental Management System which, in case of being perceived by companies, it would be after finishing the implementation stage. Lastly, the benefits were associated with the post-implementation stage, as the perception of these would not be as conclusive during the implementation of an Environmental Management System compared to the perception of these after the implementation of such management systems.

The basis for creating both hypotheses is partly based on the lack of consensus evidenced throughout the literature in regards to the benefits perceived by companies after they implement an Environmental Management System. Moreover, in the specific case of the first hypothesis, - H1 -, the additional basis for establishing is due to the conclusions of a relationship evidenced in the types of benefits obtained from implementing an Environmental Management System to the motivations that led a company to implement this management system (Prajogo et al., 2012; Álvarez-García & del RíoRama, 2016). Regarding the second hypothesis - H2 -, the additional basis for establishing this hypothesis, is related to the companies' decrease of confidence in the standard after not obtaining performance related improvements (Ferrón-Vílchez, 2016) and the difficulty to quantify the benefits derived from the implementation of an Environmental Management System (Mazzi et al, 2016).

The research hypotheses are explained up next:

H1: The benefits that companies perceive after they implement an Environmental Management System are positively impacted by the motivations that led to the company to implement these management systems.

H1(0): The benefits that companies perceive after they implement an Environmental Management System are not impacted by the motivations that led to the company to implement these management systems.

H2: The amount of benefits perceived by companies after they implement an Environmental Management System is negatively impacted by the amount of barriers encountered by them during the implementation of such management system.

H2(0): The amount of benefits perceived by companies after they implement an Environmental Management System is not negatively impacted by the amount of barriers encountered by them during the implementation of such management system.

It is important to mention that the research question one to three do not have research hypotheses themselves, as well as the motivations, benefits and barriers illustrated the figure 1. This is due to the fact that determining the motivations, barriers and benefits related to the implementation of an Environmental Management System is the input required in order to be able to determine if there is any impact of the motivations to implement this kind of systems and the barriers encountered during the implementation process, and the extend of this impact on the benefits perceived after implementing an Environmental Management System.

2.2 Research Goal & Sample

The goal of this empirical research is to gather the required information in order to be able to determine the motivations that lead companies in Lithuania to implement an Environmental Management System, the barriers encountered during its implementation, and the benefits perceived after the implementation of such management systems, which are the inputs required in order to do the regression analysis planned for this research, as the answers regarding the motivations, barriers and benefits will be analyzed through this method in order to be able to determine the impact of motivations to implement an Environmental Management System and the barriers encountered during the implementation process, on the benefits perceived after the implementation of these kind of systems.

Taking into account the fact, as mentioned during the literature review, that in Lithuania there are currently only four companies with the Eco-Management and Audit Scheme certification, the sample will be merged into Lithuanian companies that have an Environmental Management System, regardless if it is the ISO 14001 standard or the Eco-Management and Audit Scheme. This will constitute a research limitation, as it will be not possible to identify if the research results are different according to the Environmental Management System that a company implements. However, this will allow to have a potential population for the research of 672 Lithuanian companies, 668 of them that have the ISO 14001 certification according to the ISO survey, and the 4 companies that have the Eco-Management and Audit Scheme.

In order to mitigate the risk of not having enough respondents due to not having information related to the certified companies in Lithuania, during the first stage of the research itself, the following Lithuanian government institutions will be contacted in order to be able to gather the contacts of the companies in the country that have implemented one of these environmental management systems, the first institution is the Environmental Impact Assessment and Pollution Division, which belongs to the Environmental Protection Agency of Lithuania, meanwhile, the second institution to be contacted is the Ministry of Environment of the Republic of Lithuania. Additionally, accredited certification bodies in Lithuania will be also contacted in order to collect as much information as possible about which are the companies in Lithuania that have already implemented one of these Environmental Management Systems.

Table 1. **Response rate per study related to Environmental Management Systems conducted in the European Union**

(Source: Murmura et al., 2018; Schylander & Martinuzzi, 2007; Murillo-Luna & Ramón-Solans-Prat, 2008; Gurvits & Habakuk, 2016; Psomas et al., 2011; Kudłak, 2017; Martín-Peña et al., 2014; Arena et al., 2012; Álvarez-García & del RíoRama, 2016)

Author	Country	Potential Respondents	Respondents	Response Rate
Murmura et al. (2018)	Italy	1657	190	11.47%
Schylander & Martinuzzi (2007)	Austria	297	71	23.91%
Murillo-Luna & Ramón-Solans-Prat (2008)	Spain	408	98	24.02%
Gurvits & Habakuk (2016)	Estonia	442	115	26.02%
Psomas et al. (2011)	Greece	180	53	29.44%
Kudłak (2017)	Poland	960	283	29.48%
Martín-Peña et al. (2014)	Spain	603	228	37.80%
Arena et al. (2012)	Italy	119	46	38.66%
Álvarez-García & del RíoRama (2016)	Spain	255	114	44.71%
Total		4921	1198	24.34%

It is important to note that, taking into account similar studies conducted in the European Union, which are shown in table 1, in which survey was used, the average response rate was 24.34%, and including researches with response rate as low as 11.47%. Based on these results as a precedent for the current research, in case it is possible to gather the contact of all the

Lithuanian companies certified either in ISO 14001 or the Eco-Management and Audit Scheme, the expected total amount of respondents could hover between around 77 and 163.

2.3 Research Methodology

2.3.1 Research Approach, Instrument & Questionnaire Structure

The approach chosen to conduct this research is through a survey, such type of approach was used in the studies conducted by Schylander & Martinuzzi (2007), Padma et al. (2008), Murillo-Luna & Ramón-Solans-Prat (2008), Gavronski et al. (2008), Turk (2009), Psomas et al. (2011), Ronnenberg et al. (2011), Massoud et al. (2011), Wiengarten & Pagell (2012), Zhu et al. (2012), Tambunlertchai et al. (2012), Prajogo et at. (2012), Arena et al. (2012), Qi et al. (2013), Nguyen & Hens (2013), Agan et al. (2013), Martín-Peña et al. (2014), Mariotti et al. (2014), He et al. (2015), Fikru (2014), Gurvits & Habakuk (2016), Álvarez-García & del RíoRama (2016), Ferrón-Vílchez (2016), Salim et al. (2017), Kudłak (2017), and Murmura et al. (2018). Meanwhile, other approaches such as observation and experimentation were used on a seldom basis on previous researches such as the ones conducted by Crotty & Rodgers (2011), and Djekic et al. (2014). Therefore, the reason behind choosing survey as the research approach is that it is the same approach most commonly used in similar researches that were analyzed during the literature review.

After conducting the literature review, the specific research instrument chosen for the research is a questionnaire which will feature close-ended Likert scale questions, such instrument was also used in the surveys conducted by Schylander & Martinuzzi (2007), Padma et al. (2008), Murillo-Luna & Ramón-Solans-Prat (2008), Gavronski et al. (2008),Turk (2009), Psomas et al. (2011), Ronnenberg et al. (2011), Massoud et al. (2011), Wiengarten & Pagell (2012), Zhu et al. (2012), Tambunlertchai et al. (2012), Prajogo et at. (2012), Arena et al. (2012), Qi et al. (2013), Nguyen & Hens (2013), Agan et al. (2013), Martín-Peña et al. (2014), Mariotti et al. (2014), He et al. (2015), Fikru (2014), Gurvits & Habakuk (2016), Álvarez-García & RíoRama (2016), Ferrón-Vílchez (2016), Salim et al. (2017), Kudłak (2017), and Murmura et al. (2018). Consequently, the reason behind choosing a questionnaire with close-ended Likert scale questions as the research instrument is that it is similar to the instrument that was most commonly featured in similar researches that were analyzed throughout the literature review.

After conducting the literature review, it was possible to identify a total of seven motivations that were included in the research questionnaire. Moreover, only one of the

motivations mentioned in the literature was excluded, due to the fact that it is very similar to one of the motivations included in the survey. The motivations which were included on the questionnaire are: socially responsible behavior, improvement of company's environmental performance, improvement of company's corporate image, legal compliance, and pressure from external stakeholders, foreign investment and potential efficiencies derived from the implementation of the standard. Meanwhile, the motivation that will be excluded from the questionnaire is the one related to strengthening of company's brand name, as it is too similar to the motivation related to improvement of company's corporate image and it could generate confusion among respondents. However, it is important to note that the questionnaire includes an option where respondents can specify other motivations that drove their companies to implement an environmental management system.

Regarding the barriers, based on the research questions and the results from the literature review, a total of eight barriers were included on the research questionnaire. These barriers are: implementation's cost, operational costs post-implementation, doubts regarding the benefit of the standard, lack of commitment from the staff, lack of commitment from top management, lack of adequate competencies for the implementation of the Environmental Management System, amount of documentation required for the implementation, and complexity of the implementation. Moreover, similarly to the segment related to the motivation to implement an Environmental Management System, the questionnaire includes an option where respondents will have the possibility to specify other barriers that they might have encountered during the implementation of these systems.

Concerning the benefits perceived by companies after implementing an Environmental Management System, based on the research questions and the results from the literature review, a total of seven benefits were included on the research questionnaire. These benefits are: improvement of company's corporate image, improvement of relationship with stakeholders, legal compliance, improvement of company's environmental performance, reduction of resource consumption, increase in productivity, and financial gains. As with both the motivation and the barriers, the questionnaire includes the option that allows respondents to specify if there were other benefits that they perceived after implementing one of the environmental management systems.

The survey is divided into two segments itself, the first one contains the questions related to the Environmental Management System implemented by each respondent and its motivations, barriers and benefits. While the second part of the survey contains questions related to the company in general such as, amount of employees and industry which could

perhaps be useful to identify relationships between the variables that are being researched and the characteristics of each company. Detailed information about the questionnaire's structure is presented on Table 13 and Table 14.

In order to minimize the risk of non-response from companies that are not willing to share what they consider confidential information, the survey was uploaded on an online survey tool called Zoho Survey (Zoho Corporation Pvt. Ltd, 2018), therefore, the identity of the companies was kept completely confidential and their classification was done entirely through the information provided in the second segment of the survey. Moreover, the questionnaire was translated into Lithuanian language in order to minimize the risk of non-response due to the respondents not having proficiency in English language.

2.3.2 Sampling & Research Implementation

In order to conduct the research about the impact of the motivations that lead companies in Lithuania to decide to implement an Environmental Management System, and the impact of the barriers that these companies find during the implementation process, on the benefits perceived by the companies after they implement such management systems, the first step of the research itself was gathering the list of companies in Lithuania that have either the ISO 14001 or the Eco-Management and Audit Scheme certification. In order to obtain this list of companies, contact with accredited certification bodies was established, who provided the names of a total of 350 companies that have implemented one of these Environmental Management Systems, meanwhile another 50 names of companies that have implemented an Environmental Management System were gathered by using internet search engines, which composed the final list of 400 companies that were contacted during this research. It is important to mention that this stage of the research was finished on February 9, 2018. Moreover, it is important to mention that due to the signature of non-disclosure agreements with the accredited certification bodies, it is not possible to publish in this research paper neither the names of these certification bodies nor the names of the Lithuanian companies that have implemented an Environmental Management System.

The second stage of the research consisted in uploading the survey into an online survey tool called Zoho Survey (Zoho Corporation Pvt. Ltd, 2018), this tool was chosen because of two main criteria, first of all, it would allow to keep the identify of respondents confidential, which would be helpful in order to minimize the amount of non-respondents. Secondly, this particular survey tool also allowed to send customized links to each company, which were automatically deactivated once a respondent completed the survey, thus eliminating the risk of

having multiple answers from a same company. This stage of the research was finished on February 16, 2018.

The third stage of the research consisted in three sub-stages that were done simultaneously. The stage's first sub-stage consisted in establishing contact with the list of companies in Lithuania that have implemented an Environmental Management System in order to determine if they were willing to participate on the research and gather the information about e-mail account to which the survey should be sent. In order to minimize the risk of non-participation in the research if low levels of English proficiency among the list of companies were present, this establishment of initial contact was done with the assistance of persons who have proficiency in Lithuanian Language. The initial contact process was started on February 20, 2018 and finished on April 6, 2018, as it was partially executed according to the time availability of the persons who were providing assistance with the establishment of initial contact. It is important to point out, that due to the potential risk of having low response rate on the research taking into account the response rates from similar researches conducted in the European Union, as illustrated on Table 1 in the Research Sample segment of this document, no probability sampling method was implemented in this research, as contact with all companies included on the list was tried to be established. Moreover, it is important to mention that after initial contact was established, 303 companies rejected outright their participation on the survey, and it was not possible to establish contact with 28 companies, all of them belonging to the companies that were gathered by using internet search engines.

The second sub-stage of the research's third stage consisted sending the survey to the 69 companies that agreed to participate in this research. In order to send the survey to each company, a unique link was generated through Zoho Survey (Zoho Corporation Pvt. Ltd, 2018), which was afterwards included on a pre-designed e-mail template that contained a brief description of the research project and a reminder of the importance of the participation of the companies in this research, which was sent to the e-mail accounts provided during the first sub-stage of the research's third stage. This sub-stage of the research was done simultaneously with the first sub-stage from February 20, 2018 and finished on April 6, 2018. It is important to mention that a total of 44 companies answered the survey after the initial e-mail was sent to them.

The final sub-stage of the research's third stage consisted in sending the companies a reminder to participate in the survey, which was sent by e-mail. However, it is important to note that the reminder was send to all of the companies who agreed to participate in the survey, as it was mentioned previously, it was not possible to identify which companies completed the

survey on the online survey tool. It is important to mention that this constituted a change compared to what was planned during Research Project I, as the plan was to contact only the companies that haven't had answered the survey. Moreover, it is important to note that a total of 7 companies answered the survey after the reminder was sent to them, bringing the total amount of survey's respondents to 51. This reminder was sent on April 10, 2018, and the last answer was received on April 12, 2018.

The final stage of the research consisted in the consolidation of the answers from the survey, which due to the capabilities of the aforementioned online survey tool, it was possible to automatically extract the data in order to be move on to the preliminary analysis of the results. This stage of the research was done on April 14, 2018.

Finally, it is also important to mention that, although during the initial research design included in Research Methodology segment of this document, the initial stage of the planned research included meeting with the Environmental Impact Assessment and Pollution Division and Ministry of Environment of the Republic of Lithuania, and the Ministry of Environment of the Republic of Lithuania in order to obtain information about companies in Lithuania that have implemented an Environmental Management System, and also to obtain valuable insights about the perceived motivation, barriers and benefits to implement an Environmental Management System among companies in Lithuania. However, it was not possible to successfully establish contact with these government institutions, therefore this segment of the planned research was skipped in order to start contacting the companies that have implemented an Environmental Management System without having a negative impact on the research schedule.

2.3.3 Sample Size & Research Limitations

The required sample size of respondents required to successfully implement this research was calculated through statistical methods. Taking into account that the total amount of companies in Lithuania that have implemented either the ISO 14001 standard or the Eco-Management and Audit Scheme is 672, the formula for calculating sample size in small populations was used order to determine the required sample size. Moreover, a confidence interval of 90%, meaning Z value equals 1.645, was used for the calculation of sample size, plus an acceptable sample error of 11%, and 50% as estimated percent of the population were also used to determine the required sample size of this research, which resulted in a requirement of 51 respondents as sample size in this research. The sample size constitutes the first limitation acknowledged in this research, as the acceptable sample error of 11% would make it risky to

draw inferences about the results that apply to the whole amount of companies in Lithuania that have implemented either the ISO 14001 standard or the Eco-Management and Audit Scheme.

Another two limitations are acknowledged in this research, first of all, taking into account the fact that it was not possible to gather the entire list of companies in Lithuania that have implemented either the ISO 14001 standard or the Eco-Management and Audit Scheme, not all companies had the possibility to be included as part of the research's sample, therefore it was not possible to deploy a fully probability sampling, which reinforces the previous limitation in the sense that it would difficult to draw inferences of the results of this research among all companies in Lithuania that have implemented either the ISO 14001 standard or the Eco-Management and Audit Scheme.

The final limitation is that, taking into account the fact that an online survey tool was used in order to distribute the research's survey, as it was not possible to identify which companies answered the survey, after all companies were contacted, instead of being able to implement a method for evaluation of non-respondents, such as sampling of non-respondents or trend analysis, among those companies who agreed to participate in the survey but did not completed it, it was only possible to send e-mail communication to every single company reminding them to fill in the survey. This might have negatively impacted the amount of additional companies that would have answered the survey, however, taking into account the fact that the online survey tool was deployed in order to improve the response rate by keeping the confidentiality of the respondents, the aforementioned limitation was a trade-off of the research design.

3 ANALISYS OF THE EMPIRICAL DATA

3.1 Descriptive analysis of the research's respondents

Table 2. **Distribution of answers about the respondent and their companies**
(Source: author)

Type of information	Aspect	Percentages per answer	
Information about respondent	Position within company	Quality Manager	49,02%
		Environmental Manager	15,69%
		Other	35,29%
	Amount of years working within company	Average (Years)	3,54
Information about company	Amount of employees	50 to 249	84,31%
		250 or more	15,69%
	Implementation of Quality Management System prior to Environmental Management System	Yes (ISO 9001 Standard)	100%
	Company's Industry	Construction	35,29%
		Transport and Storage	11,76%
		Textile and Clothing	3,92%
		Wholesale Trade	3,92%
		Manufacturing	23,53%
		Other	21,57%

Expanding upon Table 2, it was possible to gather the following information about the respondents and their companies from the answers provided on the survey's second segment. First of all, regarding the respondents, in average they have been working at their companies for 3,54 years, and 49,02% of the respondents are the Quality Managers of their companies, whereas 15,69% were the Environmental Managers of their companies. The remaining 35,29% had other positions at their companies, such as Operations Director, and Quality Specialist. Regarding the companies, 84,31% of these have between 50 and 249 employees, whereas the remaining 15,69 have 250 or more employees. Moreover, it is important to note that all of the companies had previously implemented the ISO 9001 standard before implementing an

Environmental Management System, therefore, it will not be able to make an in-depth analysis to determine if the previous implementation of a Quality Management System is indeed a required driver in order to obtain benefits from the implementation of an Environmental Management System (Wiengarten & Pagell, 2012).

Additionally, 35,29% of the respondents indicated that their companies belong to the construction sector, whereas another 11,76% of the respondents indicated that their companies belong to the Transport and Storage sector, 3,92% of the respondents indicated that their companies belong to the Textile and Clothing sector, which is the same amount of respondents that indicated that their companies belonged to the Wholesale Trade sector. The remaining 45,10% indicated that their companies belong to other sectors such as Engineering Consulting, Maintenance, Waste Disposal, Water Treatment and most notable, Manufacturing, which accounted for 23,53% of the total amount of respondents.

As a final observation, taking into account that 51 respondents answered the survey, the response rate, among the total population of 672 companies in Lithuania that have implemented either the ISO 14001 Standard or the Eco-Management and Audit Scheme, was 7,59%, which has below the response rate of researches with a similar scope that conducted within the European Union since the year 2007. However, for comparison purposes, if only the 400 companies, which were known by the author to have implemented either the ISO 14001 Standard or the Eco-Management and Audit Scheme, were used as population to calculate the response rate of this research, it would have been 12,75%, which would be slightly above the lowest response rate among similar researches conducted previously within the European Union. Nevertheless, in both cases the response rate would be well below compared to the response rate obtained in a previous study with similar scope conducted in another Baltic state, Estonia, which had a response rate of 26.02% (Gurvits & Habakuk, 2016).

3.2 Descriptive analysis of the research's results about motivation, benefits and barriers to implement an Environmental Management System

Taking into account the first segment of the survey, where participants were asked to grade, on a scale from 1 to 5, on close-ended Likert questions the motivations that led their company to implement an Environmental Management System, the barriers their companies found during its implementation process, and the benefits perceived by the companies after successfully finishing the implementation process, the following results were obtained. In regards to motivations to implement an Environmental Management System, among the

Lithuanian companies who participated in the survey, the main motivation to implement such management systems is the improvement of the company's corporate image, with an average score of 4,37 out of 5, the second main motivation to implement such management systems is related to legal compliance, with an average score of 4,20 out of 5, whereas the third main motivation is related to improvement of the company's environmental performance, with an average score of 3,08 out of 5. On the other hand, the motivations that had the lowest score among the respondents were: the potential economic efficiencies derived from the standard, with an average score of 1,43 out of 5, followed foreign investment, with a score of 1,06 out of 5. Table 3 shows the distribution of the scores given by respondents to each one of the motivations included in the survey, and their respective average score. It is important to mention that no company included an additional motivation in the survey's option that allowed respondents to mention additional motivations to implement an Environmental Management System.

Table 3. **Distribution of scores assigned by respondents to the motivations to implement an Environmental Management System**

(Source: author)

Motivation to implement an Environmental Management System	Distribution of scores on Likert Scale					Average Score per motivation
	1	2	3	4	5	
Improvement of company's corporate image	0	0	9	14	28	4,37
Legal compliance	0	1	8	22	20	4,20
Improvement of company's environmental performance	0	6	38	4	3	3,08
Socially Responsible Behavior	1	14	28	6	2	2,88
Pressure from external stakeholders	4	36	10	1	0	2,16
Potential economic efficiencies derived from the standard	32	17	1	1	0	1,43
Foreign Investment	49	1	1	0	0	1,06
Explanation of scores: 1: Not relevant at all 2: Minimum relevancy 3: Somewhat relevant 4: Very relevant 5: Essential						

Regarding the results from the motivations to implement an Environmental Management System, it is relevant to mention that some of the values are alike to similar researches about

this topic. For instance, improvement of company's corporate image being one of the top motivations to implement an Environmental Management System is consistent with the results of similar researches held in European Union member states such as Estonia, Italy, Latvia and Poland (Tambovceva & Geipele, 2011, Arena et al., 2012; Kudłak, 2016; Gurvits & Habakuk, 2016; Murmura et al., 2018). Moreover, improvement of the company's corporate image was among the main motivations to implement an Environmental Management System in countries outside the European Union such as Malaysia, Saudi Arabia and Turkey (Agan et al., 2013; Mariotti et al., 2014; Salim et al., 2017). Furthermore, the importance given to legal compliance as a motivation to implement an Environmental Management System is also consistent with results of similar researches conducted among European Union member states such as Italy (Murmura et al., 2018), and also consistent with result of researches held outside the European Union, such as in Saudi Arabia (Mariotti et al., 2014). Additionally, the low score given by Lithuanian companies to foreign investment and potential economic efficiencies as motivators to implement an Environmental Management System are also consistent with the results that were consolidated during the literature review, as these motivations were found in countries outside the European Union such as, in the case of foreign investment, Thailand (Tambunlertchai et al., 2012), and, related to the potential economic efficiencies as a motivation, Russia (Crotty & Rodgers, 2011). These results indicate that among Lithuanian companies, that a least in terms of motivations to implement an Environmental Management System, their motivations are similar to the ones of companies in other European Union nations.

Taking into account the distribution of sector in which the companies, who participated in this research, operate, it could be possible to draw some preliminary conclusions regarding the reasons why, on average, so much importance was given to legal compliance as a motivation to implement an Environmental Management System, as the Article 16 of the Law on Environmental Protection of the Republic of Lithuania indicates that companies that want to embark on construction projects must submit documentation that guarantee compliance with the requirements of environmental quality, which must be coordinated with the Ministry of Environment of Lithuania (Lietuvos Respublikos Seimas, 2016), and construction companies constituted 35,29% of the respondents of this research.

Concerning the barriers encountered by the Lithuanian companies who participated in the survey, the main barrier encountered during this implementation of an Environmental Management System is the cost of the implementation itself, which had an average score of 2,55 out of 5. Meanwhile, the second most important barrier, according to respondents, is the amount of documentation required for the implementation of an Environmental Management

System, with an average score of 2,49 out of 5. Finally, the third main barrier is related the complexity of the implementation process, with an average score of 2,47 out of 5. On the other hand, the barriers that had the lowest score among the survey's participants were the lack of commitment from top management, with an average score of 1,86 out of 5, followed by doubts regarding the benefits of the standard, which had an average score of 1,39 out of 5. Table 4 illustrates the distribution of the scores given by respondents to each one of the barriers included in the survey, and their respective average score. As with the motivations' segment, it is important to mention that no company included an additional barrier in the survey's option that allowed respondents to mention additional barriers encountered during the implementation of an Environmental Management System.

Table 4. **Distribution of scores assigned by respondents to the barriers encountered during the implementation of an Environmental Management System**

(Source: author)

Barriers encountered during implementation of an Environmental Management System	Distribution of scores on Likert Scale					Average Score per barrier
	1	2	3	4	5	
Implementation's cost	10	15	17	6	3	2,55
Amount of documentation required for the implementation	14	14	11	8	4	2,49
Complexity of the implementation	15	15	8	8	5	2,47
Lack of adequate competencies	10	19	14	6	2	2,43
Lack of commitment from staff	15	18	9	6	3	2,29
Operational cost (Post-Implementation)	26	10	11	3	1	1,88
Lack of commitment from top management	20	20	9	2	0	1,86
Doubts regarding the benefits of the standard	41	1	8	1	0	1,39
Explanation of scores: 1: Not a problem at all 2: Minor problem 3: Moderate problem 4: Slightly serious problem 5: Serious problem						

In regards to the results of this research related to the barriers encountered during the implementation of an Environmental Management System, it is important to mention that some of the values are consistent with similar researches about the topic. For example, the cost of the implementation of an Environmental Management System has been previously identified as a

barrier in other European Union member states such as Austria and Spain (Schylander & Martinuzzi, 2007; Martín-Peña et al., 2014), as well as in countries outside the European Union such as Saudi Arabia and Turkey (Turk, 2009; Mariotti et al., 2014). However, unlike cost of the implementation, the barrier related to amount of documentation required for the implementation of an Environmental Management System, was not found during the literature review as relevant among European Union member states, as it had more impact in countries outside the European Union such as Saudi Arabia (Mariotti et al., 2014). Nevertheless, it is important to note that none of the barriers had a high average score after consolidating the results from the survey, which might be influenced by the fact that all of the companies that participated on the research had previously implemented the ISO 9001 standard, which in turn reinforces findings that suggest that previous experience with the implementation of a Quality Management System lessens the barrier of the implementation of an Environmental Management System (Psomas et al., 2011; Wiengarten & Pagell, 2012). These results could indicate that among Lithuanian companies, that a least in terms of barriers encountered during the implementation an Environmental Management System, their perceived barriers are similar to the ones of companies in other European Union member states.

Regarding the benefits perceived by companies after successfully concluding the implementation of an Environmental Management System, the main benefit, according to the companies in Lithuania that participated in the research, is the improvement of the company's corporate image, which had an average score of 4,29 out of 5. Meanwhile, the second most perceived benefit among the participants of this research is related to legal compliance, with an average score of 4,02 out of 5. The third most perceived benefit was the improvement of the company's environmental performance, however, it is important to mention that on average it was far behind the first two benefits, as its average score was 3,04 out of 5. On the other hand, the least perceived benefits, according to the companies that answered the survey, are: increase in productivity, which had an average score of 2,02 out of 5, and financial gains, which was given an average score of 1,31 out of 5. Table 5 shows the distribution of the scores given by respondents to each one of the benefits included in the survey, and their respective average score. As with the previous segments, none of the companies that participated in the survey included an additional benefit in the survey's option that allowed respondents to mention additional benefits perceived after the implementation of an Environmental Management System.

Table 5. **Distribution of scores assigned by respondents to the benefits perceived after the implementation of an Environmental Management System**

(Source: Author)

Benefits perceived after implementation of an Environmental Management System	Distribution of scores on Likert Scale					Average Score per benefit
	1	2	3	4	5	
Improvement of company's corporate image	0	2	7	16	26	4,29
Legal compliance	0	5	7	21	18	4,02
Improvement of company's environmental performance (i.e. reduction of pollution)	0	12	27	10	2	3,04
Improvement of relationship with stakeholders	8	21	15	4	3	2,47
Reduction of resource consumption (Water, energy, etc.)	15	21	10	3	2	2,14
Increase in productivity	14	23	13	1	0	2,02
Financial gains	41	4	6	0	0	1,31

Explanation of scores:
1: Not a benefit at all
2: Minor benefit
3: Moderate benefit
4: Slightly major benefit
5: Major benefit

Regarding the results from the benefits perceived by companies after finishing the implementation of an Environmental Management System, some of the results are also consistent with similar researches conducted about the topic. For instance, improvement of the company's corporate image being classified as one of the main benefits from after implementing such management systems is similar to what was reported in researches held in other European Union nations such as Austria, Estonia, Greece, Italy and Spain (Schylander & Martinuzzi, 2007; Psomas et al., 2011; Arena et al., 2012; Martín-Peña et al., 2014; Gurvits & Habakuk, 2016;). Moreover, improvement of the company's corporate image was also one of the main benefits from implementing an Environmental Management System among companies in Malaysia, Saudi Arabia, Serbia, Thailand and Turkey (Turk, 2009; Tambunlertchai et al., 2012; Djekic et al., 2014; Mariotti et al., 2014; Ong et al., 2016; Salim et al., 2017).

Similarly, legal compliance being one of the main benefits obtained after implementing an Environmental Management System has been reported in similar researches held within the European Union in countries such as Estonia, Italy and Latvia (Tambovceva & Geipele, 2011; Gurvits & Habakuk, 2016; Mazzi et al., 2016; Murmura et al., 2018), as well as in countries

outside the European Union such as Vietnam (Nguyen & Hens, 2013). On the other hand, in terms of financial benefits obtained from the implementation of an Environmental Management System, taking into account the low score given by respondents to the benefit of financial gains after the implementation of such management system, which is consistent with conclusions from similar researches which found no financial benefit from the implementation of an Environmental Management System (Watson et al., 2004; He et al., 2015), but at the same time contradicts the findings about companies perceiving financial benefits after the implementation of an Environmental Management System (Lankoski, 2007; Murillo-Luna & Ramón-Solans-Prat, 2008; Sinkin et al., 2008; Horváthová, 2010; Lo et al., 2011).

As a final observation, regarding the survey's question regarding the Environmental Management System implemented at the respondent's company, it is important to mention that all of the respondents indicated that their companies had implemented the ISO 14001 standard, and none of the companies had implemented the Eco-Management and Audit Scheme. However, this distribution of answers will not have a negative impact on the research due to the fact, as explained on the Research Sample segment of this document, due to the fact that only 4 companies in Lithuania have implemented the Eco-Management and Audit Scheme, which would not allow to have a representative sample even if all 4 of them answered the survey, the research's sample was merged into one that included both the companies in Lithuania that have implemented the Eco-Management and Audit Scheme, as well as those that have implemented the ISO 14001 standard.

3.3 Testing of research's hypotheses

In order to proceed with the testing of the statistical hypotheses included in this research, the data was loaded into SPSS. Once the data was loaded, this data was checked through a frequencies analysis with the intention of double-checking the information that was analyzed during the Research Project II. It is important to note that a change was required on the data codification in order to be able to test the statistical hypotheses of this research, as the numerical values of the results of the barriers were re-coded into SPSS with a scale which is the opposite to the included on the questionnaire, which means that instead of coding the answers from a scale from 1 to 5, the answers where coding on the inverse scale, from 5 to 1. This change allowed to increase the Cronbach Alpha from 0,406 to 0,645, indicating an adequate internal consistency. Moreover, it is important to mention that the results from the Kolmogorov-Smirnov test, as illustrated on the Annex on Table 15, show that the data from this research

does not have a normal distribution. The statistical hypotheses themselves were tested through five different sets regression analyses, which will be explained throughout this segment. The null hypotheses included on this research, as explained with more detail on segment 2.1, are shown up next:

H1(0): The benefits that companies perceive after they implement an Environmental Management System are not impacted by the motivations that led to the company to implement these management systems.

H2(0): The amount of benefits perceived by companies after they implement an Environmental Management System is not negatively impacted by the amount of barriers encountered by them during the implementation of such management system.

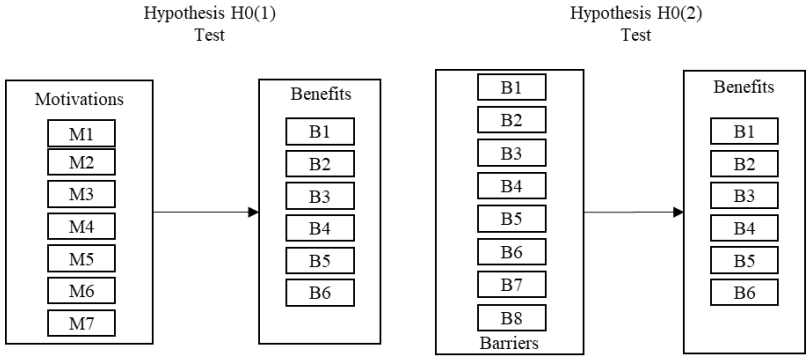

Figure 2. Model of first set of tests

(Author: Marcos Pérez Rivas)

Table 6. **Equations from first set of tests**

(Source: Author)

Test	Linear Regression Equations
Motivations – Hypothesis H0(1)	Benefit1 = 1,539+0,164*(M1)+0,148*(M2)+0,436*(M3)+0,066*(M4)+0,151*(M5)-0,812*(M6)+0,112*(M7)
	Benefit2 = (-2,206)+0,810*(M1)+0,262*(M2)+0,030*(M3)+0,509*(M4)-0,044*(M5)-0,643*(M6)+0,025*(M7)
	Benefit3 = 0,827-0,298*(M1)+0,361*(M2)+0,173*(M3)+0,573*(M4)+0,061*(M5)-0,161*(M6)+0,130*(M7)
	Benefit4 = (-0,203)+0,278*(M1)+0,517*(M2)-0,123*(M3)+0,332*(M4)+0,072*(M5)-0,894*(M6)+0,549*(M7)
	Benefit5 = 0,681-0,275*(M1)+0,379*(M2)-0,051*(M3)+0,101*(M4)+0,265*(M5)-0,215*(M6)+0,374*(M7)
	Benefit6 = 1,404-0,178*(M1)+0,281*(M2)+0,032*(M3)+0,058*(M4)-0,122*(M5)-0,202*(M6)+0,253*(M7)
	Benefit7 = 0,915-0,067*(M1)-0,201*(M2)-0,045*(M3)-0,026*(M4)+0,334*(M5)+0,224*(M6)+0,391*(M7)
Barriers – Hypothesis H0(2)	Benefit1 = 2,879+0,244*(B1)+0,095*(B2)+0,033*(B3)-0,221*(M4)+0,201*(B5)-0,271*(B6)+0,030*(B7)+0,237*(B8)
	Benefit2 = 2,609+0,083*(B1)+0,004*(B2)+0,011*(B3)-0,115*(M4)-0,201*(B5)+0,141*(B6)-0,111*(B7)+0,206*(B8)
	Benefit3 = 2,291+0,113*(B1)+0,251*(B2)+0,089*(B3)-0,225*(M4)+0,166*(B5)+0,097*(B6)-0,221*(B7)+0,099*(B8)
	Benefit4 = 2,291+0,113*(B1)+0,251*(B2)+0,089*(B3)-0,225*(M4)+0,166*(B5)+0,097*(B6)-0,221*(B7)+0,099*(B8)
	Benefit5 = (-0,215)+0,086*(B1)+0,116*(B2)+0,127*(B3)-0,165*(M4)-0,068*(B5)+0,215*(B6)-0,192*(B7)+0,147*(B8)
	Benefit6 = (-0,199)+0,218*(B1)-0,115*(B2)+0,228*(B3)+0,250*(M4)-0,092*(B5)+0,017*(B6)-0,027*(B7)+0,128*(B8)
	Benefit7 = 0,084+0,120*(B1)+0,203*(B2)+0,043*(B3)+0,003*(M4)+0,040*(B5)-0,076*(B6)-0,059*(B7)+0,021*(B8)

The first set of tests, shown on Figure 2, consisted in conducting linear regressions, in which all motivations to implement an Environmental Management System were tested against each one of the benefits perceived from the implementation of such management systems. Moreover, all barriers encountered during the implementation of such management systems were also tested against each one of the benefits included on this research. Through this initial set of tests, as shown on the Annex on Table 17 and Table 18, 12 out of the 14 tests executed were statistically significant. Moreover, the R Square obtained during these set of tests was between 0,110 and 0,457, which means that the variance of the motivations and barriers explain less than 50% of the variation on the benefits perceived by companies after implementing an Environmental Management System. It is worth to mention that through these tests, the benefit that received the biggest impact from the motivations is the one related to improvement of company's environmental performance, with an R Square of 0,457, whereas the benefit receiving the largest influence from the barriers is the one related to increase in productivity, with an R Square of 0,360. Additionally, as shown on the equations from this set of tests included on Table 6, the constant value from the equation tends to be large, while the weight of each independent variable tends to be lower, which might indicate a low impact of the motivations and barriers on the benefits perceived by companies. The motivation that had the largest impact on average on each one of the equations is the one related to Improvement of company's environmental performance, with an average value of 0,250, whereas the barrier with the largest influence on average on all equations is the complexity of the implementation, with a average value of 0,118. In conclusion, it would not be possible to completely reject the statistical hypotheses of this research, as even if the benefits are being impacted by both the motivations and the barriers, the impact observed on this set of tests is low. More detailed information about the results from this set of tests is included on the Annex on Table 17 and Table 18. Moreover, the equivalence of the abbreviations included on the model and equations, not only from this set of tests, but also from subsequent tests, is included on the Annex on Table 16.

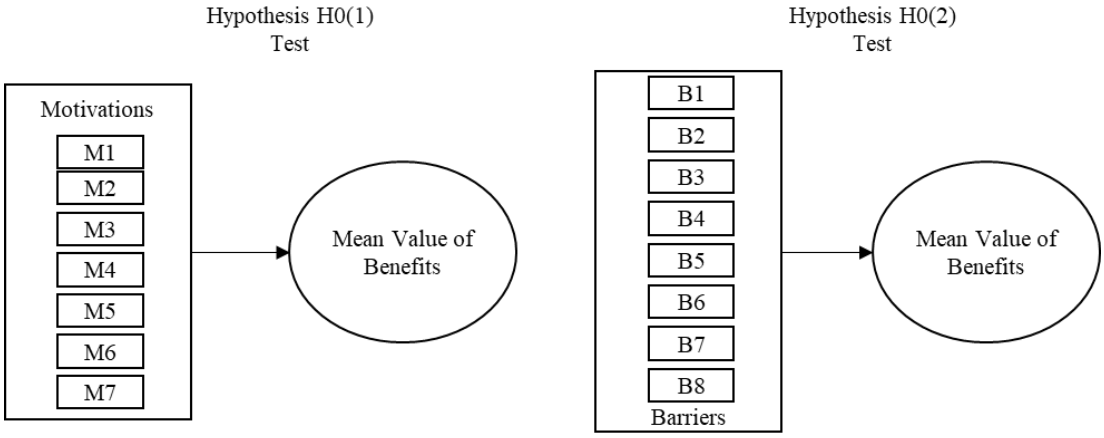

Figure 3. Model of second set of tests

(Author: Marcos Pérez Rivas)

Table 7. **Equations from second set of tests**

(Source: Author)

Test	**Linear Regression Equations**
Hypothesis H0(1)	Mean Benefit = (-0,999)+0,087*(M1)+0,528*(M2)+0,177*(M3)+0,228*(M4)-0,032*(M5)-0,346*(M6)+0,299*(M7)
Hypothesis H0(2)	Mean Benefit = 0,935+0,176*(B1)+0,035*(B2)+0,003*(B3)-0,086*(M4)+0,062*(B5)-0,011*(B6)-0,025*(B7)+0,285*(B8)

Table 8. **Backup data from second set of tests - Motivations**

(Source: author)

Benefit Tested	Summary		ANOVA	Coefficients								
	R	R Square	Sig.	(Constant)	M1	M2	M3	M4	M5	M6	M7	
Hypothesis H0(1)	,569[a]	,324	,000[b]	-0,999	,087	,528	,177	,228	-,032	-,346	,299	
Benefit Tested	Summary		ANOVA	Coefficients								
	R	R Square	Sig.	(Constant)	B1	B2	B3	B4	B5	B6	B7	B8
Hypothesis H0(2)	,520[a]	,270	,000[b]	0,935	,176	,035	,003	-,086	,062	,011	-,025	,285

The second set of tests, illustrated on Figure 3, all motivations to implement an Environmental Management System, as well as all barriers encountered by companies during the implementation of such management systems were tested against the mean value of the benefits perceived by companies after implementation of an Environmental Management System. The R Square obtained during these set of tests for motivations and barriers, as shown on Table 8, was 0,324 and 0,270 respectively, which show that the motivations have a larger

impact on the benefits perceived by companies after implementing an Environmental Management System, as these explain 32,4% of the variation of the benefits, whereas the barriers explain only 27% of the variation of the perceived benefits. Taking into account the R Square values obtained from this set of tests, the impact of both motivations and barriers is low. Furthermore, as shown on the equations from this set of tests included on Table 7, the weight of the independent variables is lower than the value of the constant, which might indicate a that other variables, which were not included on the scope of this research, have a larger impact on the benefits perceived by companies after implementing an Environmental Management System. Therefore, from this set of tests would not be possible to fully reject the research's statistical hypotheses, this is due to the fact that, despite obtaining statistically significant results on all four tests, the degree of impact by the motivations and the barriers on the benefits is low.

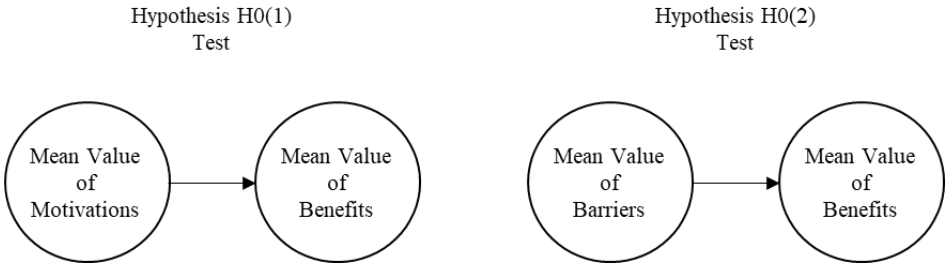

Figure 4.

Figure 4. Model of third set of tests

(Author: Marcos Pérez Rivas)

Table 9. **Equations from third set of tests**

(Source: Author)

Test	**Linear Regression Equations**
Hypothesis H0(1)	Mean Benefit = (-0,532)+1,14*(Mean Motivations)
Hypothesis H0(2)	Mean Benefit =1,450+0,291*(Mean Barriers)

Table 10. **Backup data from third set of tests**

(Source: author)

Test	Summary		ANOVA	Coefficients	
	R	R Square	Sig.	(Constant)	IND
Hypothesis H0(1)	,429[a]	,184	,000[b]	-0,532	1,14
Hypothesis H0(2)	,328[a]	,108	,000[b]	1,450	,291

The third set of tests, as shown on Figure 4, consisted in linear regressions where the mean values of the motivation to implement an Environmental Management System, as well as the mean values of barriers encountered during the implementation of such management systems were tested against the mean value of the benefits perceived after the implementation of an Environmental Management System. In line with the results from the previous two sets of test, the R Square obtained during the regressions is low, as the values obtained for motivations and barriers, as shown on Table 10 is 0,184 and 0,108 respectively, which indicates that the benefits and barriers explain less than 20% of the variation on the benefits perceived by companies after the implementation of an Environmental Management System, whereas the remaining 80% of the variation would be explained by variables not included on the scope of this research. Therefore, even though statistically significant results were obtained, as shown on Table 10, the results from this set of tests do not allow either to entirely reject the statistical hypotheses of this research, as again, the degree of impact of the motivations and barriers on the benefits perceived is quite low.

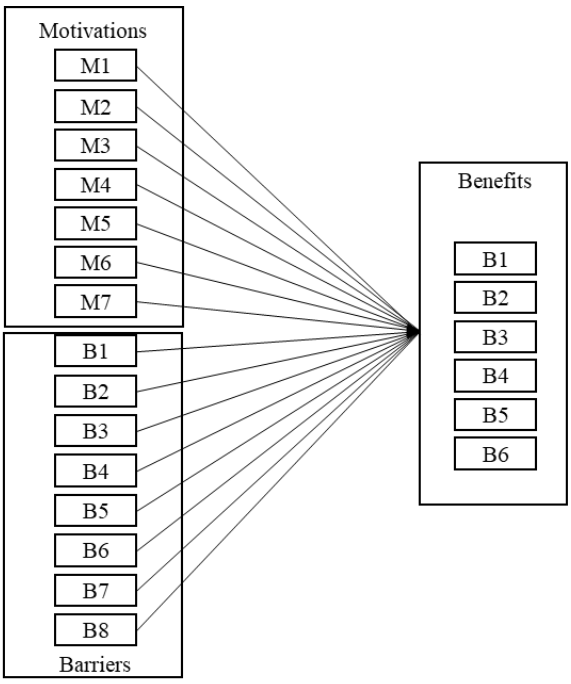

Figure 5. Model of fourth set of tests

(Author: Marcos Pérez Rivas)

Table 11. **Equations from fourth set of tests**

(Source: Author)

Test	Linear Regression Equations
Motivations and Barriers	Benefit1 = 0,809+0,178*(M1)+0,012*(M2)+0,443*(M3)+0,015*(M4)+0,056*(M5)-0,766*(M6)+0,097*(M7) +0,182*(B1)+0,107*(B2)-0,039*(B3)-0,171*(M4)+0,236*(B5)-0,233*(B6)-0,067*(B7)+0,371*(B8)
	Benefit2 = (-1,774)+0,941*(M1)-0,173*(M2)+0,174*(M3)+0,514*(M4)-0,135*(M5)-0,197*(M6)+0,101*(M7) +0,067*(B1)+0,046*(B2)-0,079*(B3)-0,073*(M4)-0,271*(B5)+0,163*(B6)-0,140*(B7)+0,213*(B8)
	Benefit3 = (-1,263)-0,239*(M1)+0,263*(M2)+0,202*(M3)+0,593*(M4)-0,149*(M5)-0,127*(M6)+0,003*(M7) +0,074*(B1)+0,276*(B2)+0,104*(B3)-0,203*(M4)+0,126*(B5)+0,188*(B6)-0,120*(B7)+0,100*(B8)
	Benefit4 = (-1,679)+0,229*(M1)+0,571*(M2)-0,087*(M3)+0,353*(M4)+0,128*(M5)-0,862*(M6)+0,513*(M7) +0,090*(B1)-0,065*(B2)-0,136*(B3)-0,027*(M4)+0,224*(B5)-0,399*(B6)-0,010*(B7)-0,150*(B8)
	Benefit5 = (-3,183)-0,087*(M1)+0,478*(M2)-0,143*(M3)+0,227*(M4)+0,066*(M5)-0,692*(M6)+0,461*(M7) -0,054*(B1)+0,184*(B2)+0,114*(B3)+0,222*(M4)-0,039*(B5)+0,264*(B6)-0,168*(B7)+0,095*(B8)
	Benefit6 = (-1,474)-0,243*(M1)+0,443*(M2)-0,049*(M3)+0,158*(M4)-0,094*(M5)-0,476*(M6)+0,045*(M7) +0,142*(B1)-0,109*(B2)+0,288*(B3)-0,273*(M4)-0,036*(B5)-0,012*(B6)+0,025*(B7)+0,093*(B8)
	Benefit7 = 0,604+0,055*(M1)-0,477*(M2)-0,085*(M3)-0,017*(M4)+0,114*(M5)+0,549*(M6)+0,638*(M7) +0,133*(B1)+0,349*(B2)-0,103*(B3)-0,005*(M4)-0,127*(B5)-0,002*(B6)+0,054*(B7)+0,013*(B8)

The fourth set of tests, shown on Figure 5, consisted in conducting linear regressions, in which, simultaneously, all motivations to implement an Environmental Management System and all barriers encountered during the implementation of such management systems were tested against each one of the benefits perceived after the implementation of an Environmental Management System. The R Square results obtained during these set of tests was between 0,268 and 0,609, which means that, joined together, the motivations and barriers explain less than 61% of the variation on the benefits perceived by companies after implementing an Environmental Management System. The benefits that received the largest impact by both motivations and barriers are the ones related to improvement of company's environmental performance and financial gains, which had R Square results of 0,609 and 0,562 respectively. Moreover, as shown on the equations from this set of tests included on Table 11, the constant value from the equation tends to be large, while the weight of each independent variable tends to be lower, which might indicate a low impact of the motivations and barriers on the benefits perceived by companies. On average, the motivation related to legal compliance had the biggest influence on the equations with an average value of 0,263, whereas the barrier related to operational costs had the largest average influence on the equations, with an average value of 0,112. According to the results obtained from this set of tests it would not be possible to completely reject the statistical hypotheses of this research, despite that statistically significant results were obtained, the degree of the impact on the benefits perceived by the motivations and barriers is rather low. Moreover, although it not part of the goals included in this research, it is important to mention that no relation was found between the motivations and barriers, as the

direction of the impact of each of their variables, either negative or positive, was different on most equations and no trend was detected. More detailed information about the results from this set of tests is included on Table 19.

In order to conduct the last set of regression analyses, a simple factor analysis was performed on SPSS with the intention of identifying the latent constructs of motivations to implement an Environmental Management System, as well as to identify similar latent constructs of the barriers encountered during the implementation of such management systems. This simple factor analysis showed two constructs related to the motivations to implement an Environmental Management System, the first construct is composed of: socially responsible behavior, improvement of company's environmental performance, improvement of company's corporate image, legal compliance and foreign investment, whereas the second construct consists of: pressure from external stakeholders and potential economic efficiencies derived from the standard. Moreover, the exploratory factor analysis presented the following three constructs related to the barriers encountered during the implementation of an Environmental Management System: the first construct is composed of lack of adequate competencies for the implementation of the environmental management system, amount of documentation required for the implementation and complexity of the implementation, the second construct consists of doubts regarding the benefits of the standard, lack of commitment from staff and lack of commitment from top management, while the last construct is composed of implementation's cost and operational cost post-implementation.

Table 12. **Validation of constructs**

(Source: Author)

Constructs	Kaiser-Meyer-Olkin Measure of Sampling Adequacy	Bartlett's Test of Sphericity			Validity			Reliability
		Approx. Chi-Square	df	Sig.	MSV	AVE	Composite Reliability	Cronbach Alpha
Motivations Construct 1	0,66	353,148	21	,000	0,43	0,59	0,87	0,67
Motivations Construct 2					0,43	0,57	0,72	0,65
Barriers Construct 1	0,68	340,856	28	,000	0,21	0,74	0,89	0,71
Barriers Construct 2					0,16	0,54	0,77	0,63
Barriers Construct 3					0,13	0,50	0,66	0,61

Prior to conducting the regression analyses, the constructs were checked in order to determine its adequacy. As illustrated on Table 12, the constructs themselves had results above 0,6 threshold on the Kaiser Meyer Olkin measure of sampling adequacy, as well as having

statistically significant results on Bartlett's Test of Sphericity, which confirms the adequacy of the constructs. Moreover, based on the Average Variance Extracted, it was possible determine the discriminant and convergent validity of the constructs, as the Maximum Shared Variance was below the Average Variance Extracted score for each construct, which confirmed discriminant validity, whereas the Composite Reliability was above the Average Variance Extracted score of each construct, which allowed to confirm the convergent validity. Furthermore, taking into account that Cronbach's Alpha was above 0,6 on each one of the constructs, it was possible to determine that these constructs also had internal consistency reliability.

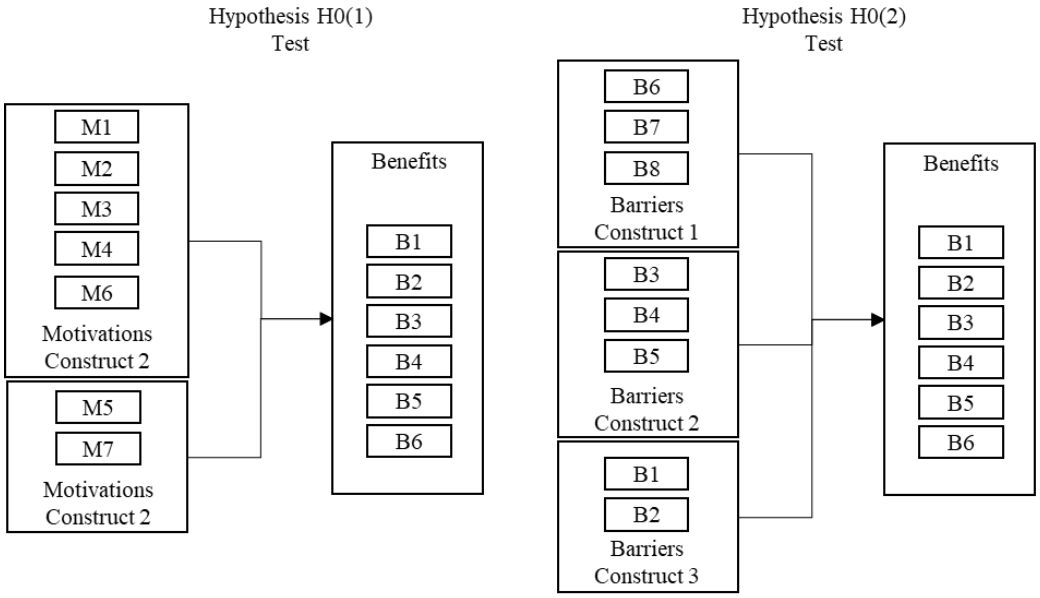

Figure 6. Model of fifth set of tests

(Author: Marcos Pérez Rivas)

During the last set of tests, as illustrated on figure 6, each one constructs related to the motivations to implement an Environmental Management System as well as against the constructs related to the barriers encountered during the implementation of such management systems were tested again the benefits perceived from the implementation of such management. Under this set of tests, 38% of the test, 16 out of 35 total tests were not statistically significant, as shown on the Annex on Table 20. Moreover, the maximum R Square obtained during these set of tests was 0,263, while the minimum score was 0,0002, which means that the variance of the motivations and barriers grouped under these constructs explain less than 26% of the variation on the benefits perceived by companies after implementing an Environmental

Management System. These results reinforce the finding from the previous four sets of tests, as despite being able to identify through the equations a possible relation of both motivations and barriers with the benefits perceived by companies after implementing an Environmental Management System, the relationship might be weak, perhaps indicating that other variables, not included on the scope of this research have a larger impact on the benefits. The equations from this set of tests are included on the Annex on Table 21.

After analyzing the results from all five set of tests, it can be concluded that the most fitting model is the second one, in which all motivations to implement an Environmental Management System, as well as all barriers encountered by companies during the implementation of such management systems were tested against the mean value of the benefits perceived by companies after implementation of an Environmental Management System. This set of tests is considered to be the most apt despite having R Square values for motivation and barriers of 0,324 and 0,270 respectively, as other set of tests which had higher R Square values on certain benefits, such as the first one, also had benefits in which the R Square value was considerably below the ones belonging to the set of tests number two. Moreover, all of the results from this set of tests were statistically significant, whereas the first set of test, as well as the fifth set of test showed a few results which were not statistically significant. According to the results from this model, the motivation with the largest influence on the benefits perceived is the one related to improvement of company's environmental performance, which is similar to the results obtained on the first set of tests. On the other hand, the barrier with the biggest influence on the benefits perceived is the complexity of the implementation of an Environmental Management System, which was similar to the results obtained on the first set of tests. As a final observation, it is important to mention that despite obtaining low R Square values on all five set of tests, the R Square values of the motivations were consistently higher in comparison to the R Square values of the barriers, which indicates that the motivations to implement an Environmental Management System have a higher impact than the barriers encountered during the implementation, on the benefits perceived after finishing the implementation of such management systems.

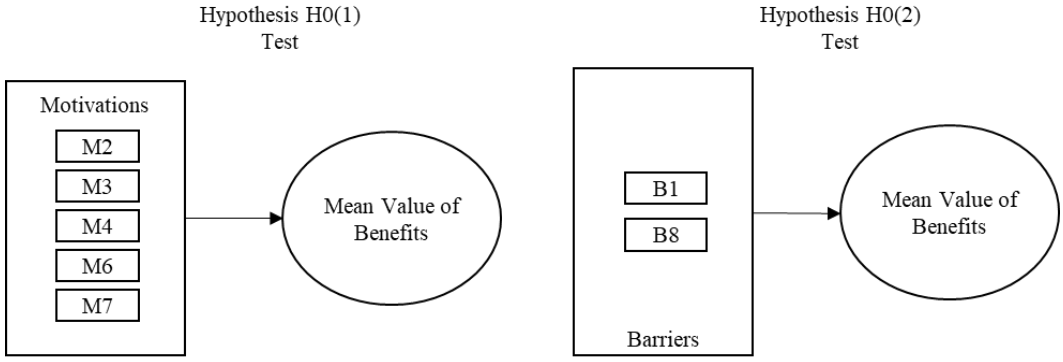

Figure 7. Resulting Visual Model – Second Set of Tests

(Author: Marcos Pérez Rivas)

Based on the results obtained from the second set of tests, the resulting visual model, as illustrated on Figure 7, shows that benefits perceived by companies after the implementation of an Environmental Management System is impacted by five motivations instead of seven motivations, as originally included on this research, this is due to the fact that the motivations related to socially responsible behavior and pressure from external stakeholders had a multiplier value below 0,100 on the resulting equation from this set of tests, as shown on table 7, whereas the remaining motivations had multiplier values ranging from 0,177 to 0,528, which means that these 2 motivations are excluded from this model as their impact on the benefits perceived by companies is too low in comparison to the rest of the motivations. In regards to the impact of the barriers encountered during the implementation of an Environmental Management System on the benefits perceived by companies after implementation of such management systems, the resulting visual model is composed only by two barriers, specifically the ones related to complexity of the implementation and cost of the implementation, as the remaining six barriers included initially on this research had multiplier values below 0,100 on the resulting equation rom this set of test, as shown on table 7, whereas these two barrier had multiplier values on the equation of 0,285 and 0,176 respectively, which means that from the barriers included in this research, only the complexity of the implementation and cost of the implementation have perceivable impact on the benefits perceived by companies, while the impact of the remaining barriers is quite weak.

CONCLUSIONS AND FUTURE RESEARCH

Conclusions

1. Based on the results from the empirical research it is possible to conclude that the main motivations to implement an Environmental Management System among Lithuanian companies are: improvement of the company's corporate image, and legal compliance. These two benefits were considered as the main ones due to the fact that they had average scores above 4,00 on the research's survey whereas the remaining 5 benefits had scores ranging from 1,06 to 3,08. It is important to mention that these results share some similarities to the results of similar researches conducted within European Union member states. For instance, improvement of the company's corporate image, was found to be also one of the main motivations to implement an Environmental Management System among companies in countries such as Estonia, Italy, Latvia and Poland.

2. Regarding the barriers to implement an Environmental Management System, according to the results of the empirical research, it can be concluded that among Lithuanian companies, the main barriers perceived during the implementation of an Environmental Management System are: cost of the implementation, amount of documentation required for its implementation, complexity of the implementation, and lack of adequate competencies. These four barriers were chosen as the main ones, as they were the only ones which had an average score above 2,40 on the research's survey. Moreover, it is worth mentioning that these results also share similarities with the results of researches with similar scope conducted within companies operating in other European Union member states, as for example, cost of the implementation was also reported to be one of the main barriers for the implementation of an Environmental Management System among companies in Austria and Spain.

3. Taking into account the results of the empirical research, it can also be concluded that the main perceived benefits by Lithuanian companies after the implementation of an Environmental Management System are: improvement of the company's corporate image, and legal compliance. These two benefits were considered as the main ones due to the fact that they had average scores above 4,00 on the research's survey whereas the remaining 5 benefits had scores ranging from 1,31 to 3,04. In addition, it is worth stating that these results also share similarities with other researches conducted among other European Union member states. For instance, improvement of the company's corporate image was one of the main benefits obtained after the implementation of such management systems in Austria, Estonia, Greece, Italy and Spain.

4. Taking into consideration that through the results from the sets of regressions which were tested throughout this research it was possible to determine a weak relationship between the motivations to implement an Environmental Management System and the benefits perceived by companies after its implementation, which can be exemplified through the fact that, on all set of tests conducted throughout this research, the maximum variation on the benefits perceived which could be allocated to the motivations was 60%, and in most cases lower. It can be concluded that for Lithuanian companies, either the underlying motivations to implement an Environmental Management System are different to the variables included on this research, or what companies in Lithuania consider as a benefit obtained after the implementation of an Environmental Management System is different in comparison to the motivations included in this research.

5. In regards to the impact of the barriers encountered by companies during the implementation of an Environmental Management System on the benefits perceived by companies after completing the implementation of such management system, taking into account that, based on the results from this research, the impact caused by the barriers on the benefits perceived by companies is weak, as all set of tests conducted on this research allowed to allocate a maximum of 40% on the variation on the benefits perceived caused by the barriers, as well as taking into consideration that, on the empirical research, all barriers had average scores between 1,39 and 2,55, it can be concluded that for Lithuanian companies, either they have obtained such level of expertise, perhaps due to the previous implementation of other Quality Management Systems, that the barriers to implement an Environmental Management System are not considered as difficult, therefore having low impact on the benefits perceived by companies, or that for Lithuanian companies, the barriers related to the implementation of an Environmental Management System are different to the ones included in the scope of this research.

6. In terms of individual variables, the results from the regressions on the research's most fitting model, specifically the model from the second set of tests, which is illustrated on figure 3, show that the motivation with the largest influence on the benefits perceived by companies in Lithuania is the one related to improvement of company's environmental performance, whereas the barrier with the biggest influence on the benefits is the complexity of the implementation of an Environmental Management System, which was similar to the results obtained on the first set of tests. It is noteworthy that both improvement of company's environmental performance and complexity of the implementation among the main motivations and barriers respectively according to the results from the empirical research.

Future Research

As a final observation from this research, taking into account the fact that one of the main limitations of this research is related to the limited sample size, it would be interesting to do similar researches in the future, hopefully again with Lithuanian companies, aiming at obtaining a larger amount of respondents in comparison to the current research, which would allow to determine if there could be any noticeable differences attributed to the sample size. Moreover, it would be interesting to complement this research with qualitative methods in order to obtain a deeper understanding on the perception of companies of the motivations, barriers and benefits associated to the implementation of Environmental Management System, which in turn could allow to identify variables that might have a bigger impact on the benefits that companies perceived after implementing such management systems.

SUMMARY

Marcos Pérez Rivas

IMPACT OF MOTIVATION AND BARRIERS ON THE BENEFITS OF THE IMPLEMENTATION OF AN ENVIRONMENTAL MANAGEMENT SYSTEM

Final Master Thesis

Academic supervisor: Assist. Prof. D. Ruželė

Vilnius University, Faculty of Economics and Business Administration

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Size: 64 pages, 7 figures, 21 tables

The aim of this master's thesis was to determine the extent of the impact on the benefits obtained by companies after implementing an Environmental Management System cause by the motivations to implement such management systems and by the barriers encountered during the implementation process. In order to conduct the master thesis' research, two methods were used. The first one consisted in an empirical method, specifically the survey, which was used to gather the primary data required for this research. A total of 51 companies out of 668 Lithuanian companies that have implemented the ISO 14001 standard answered the survey. The second research method was regression analysis, which was used to test the statistical hypothesis of this research. The results from the regressions show that most motivations to implement an Environmental Management System, as well as the barriers encountered during the implementation process have a weak impact on the benefits perceived by companies. Only a specific motivation, improvement of company's environmental performance show a relatively moderate impact on the benefits obtained by companies.

SANTRAUKA

Marcos Pérez Rivas

APLINKOSAUGINĖS SISTEMOS DIEGIMO MOTYVŲ
IR DIEGIMO KLIŪČIŲ ĮTAKA ĮDIEGTOS SISTEMOS NAUDAI

Baigiamasis magistro darbas
Vadovas: jaun. asist. D. Ruželė
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Apimtis: 64 puslapiai, 7 paveikslai, 21 lentelė

Šio baigiamojo Magistro darbo tikslas yra nustatyti, kokią įtaką aplinkosauginės vadybos sistemos įdiegimo naudai daro motyvacija įdiegti aplinkosaugos vadybos sistemą ir kliūtys, su kuriomis susiduriama diegiant aplinkosaugos sistemą.

Atliekant Magistro baigiamojo darbo tyrimą buvo panaudoti du metodai. Pirmasis buvo empirinis metodas, būtent apklausa, kurios metu buvo surinkti pirminiai duomenys, reikalingi šiam tyrimui. Į klausimyno klausimus atsakė 51 iš 668 Lietuvos įmonių, įdiegusių ISO 14001 standartą. Antrasis tyrimo metodas buvo regresinė analizė, kuri buvo panaudota tiriant darbo metu iškeltas statistines hipotezes.

Regresijos tyrimo rezultatai rodo, kad didžioji dalis motyvų įgyvendinti aplinkosaugos vadybos sistemą, taip pat kliūtys, su kuriomis susiduriama įgyvendinant procesą, daro silpną įtaką naudoms, gautoms įdiegus aplinkosaugos vadybos sistemą. Tik motyvacija pagerinti įmonės aplinkosauginės veiklos veiksmingumą daro vidutinę įtaką organizacijų naudai, gautai įdiegus aplinkosaugos vadybos sistemą.

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APPENDIX

Table 13. **Survey's First Segment**

(Source: author)

1	Kuri aplinkosauginė sistema yra taikoma jūsų organizacijoje?		ISO 14001		EMAS	
2	Įvertinkite svarbą motyvų, jūsų organizacijoje paskatinusių taikyti aplinkosauginę sistemą: 1: Visai nesvarbu, 2: Minimaliai svarbu, 3: Vidutiniškai svarbu, 4: Labai svarbu, 5: Ypač svarbu	1	2	3	4	5
	Socialiai atsakinga elgsena					
	Organizacijos aplinkosauginių rezultatų pagerinimas					
	Organizacijos įvaizdžio pagerinimas					
	Įstatyminių reikalavimų vykdymas					
	Išorinių visuomenės grupių įtaka					
	Užsienio investicijos					
	Dėka standarto taikymo potencialiai gautina ekonominė nauda					
	Kita (nurodykite)					
3	Nurodykite laipsnį kliūčių, su kuriomis jūsų organizacija susidūrė taikymo metu: 1: Ne kliūtis, 2: Maža kliūtis, 3: Vidutinė kliūtis, 4: Svarbi kliūtis, 5: Esminė kliūtis	1	2	3	4	5
	Diegimo kaštai					
	Su papildomomis veiklomis susiję kaštai po diegimo					
	Abejonės dėl standarto taikymo naudos					
	Darbuotojų nenoras prisidėti prie taikymo					
	Vadovų nenoras prisidėti prie taikymo					
	Taikymui reikiamų kompetencijų trūkumas					
	Didelė taikymui reikalingos dokumentacijos apimtis					
	Didelis taikymo kompleksiškumas					
	Kita (nurodykite)					
4	Nurodykite dydį naudų, gautų įdiegus aplinkosauginę sistemą 1: Ne nauda 2: Minimali nauda, 3: Vidutinė nauda, 4: Didelė nauda, 5: Esminė nauda	1	2	3	4	5
	Organizacijos įvaizdžio pagerėjimas					
	Organizacijos santykių su išorinėmis visuomenės grupėmis pagerėjimas					
	Teisės reikalavimų įvykdymas					
	Organizacijos aplinkosauginių veiklos rezultatų pagerėjimas (pavyzdžiui, taršos sumažėjimas)					
	Sunaudojamų resursų (vandens, energijos ar pan.) apimties sumažėjimas					
	Produktyvumo padidėjimas					
	Finansinė nauda					
	Kita (nurodykite)					

Table 14. **Survey's Second Segment**

(Source: author)

Jūsų ir organizacijos bendrieji duomenys					
a	Įvardinkite jūsų pareigas šioje organizacijoje				
B	Nurodykite, kiek metų jūs dirbate šioje organizacijoje				
c	Organizacijos darbuotojų skaičius	0 iki 9		10 iki 49	
		50 iki 249		250 ir daugiau	
D	Ar organizacija jau taikė kitą kokybės vadybos sistemą prieš pradėdama diegti aplinkosaugos sistemą? (Taip arba Ne) (Jei Ne, praleskite C klausimą)	Taip		Ne	
E	Kokią kokybės vadybos sistemą organizacija jau taikė prieš pradėdama diegti aplinkosaugos sistemą? (pasirinkite)	ISO 9001		Kita (nurodykite)	
f	Kokioje šakoje dirba organizacija? (pasirinkite)	Tekstilė ir drabužiai		Maisto pramonė	
		Transportas ir logistika		Didmeninė prekyba	
		Finansai		Mažmeninė prekyba	
		Statyba		Kita (nurodykite)	

Table 15. **Kolmogorov-Smirnov Test**

(Source: author)

Variable	Normal Parameters		Most Extreme Differences			Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
	Mean	Std. Deviation	Absolute	Positive	Negative		
M1	3.095	0.805	0.316	0.316	-0.256	3.829	0.000
M2	3.184	0.712	0.432	0.432	-0.317	5.234	0.000
M3	4.293	0.787	0.312	0.184	-0.312	3.786	0.000
M4	4.061	0.804	0.232	0.204	-0.232	2.808	0.000
M5	2.197	0.544	0.417	0.417	-0.311	5.055	0.000
M6	1.102	0.401	0.532	0.532	-0.400	6.455	0.000
M7	1.395	0.625	0.396	0.396	-0.264	4.799	0.000
B1	3.456	1.136	0.174	0.173	-0.174	2.111	0.000
B2	4.136	1.058	0.303	0.207	-0.303	3.676	0.000
B3	4.626	0.796	0.490	0.319	-0.490	5.946	0.000
B4	3.721	1.192	0.246	0.142	-0.246	2.977	0.000
B5	4.122	0.843	0.238	0.184	-0.238	2.888	0.000
B6	3.619	1.036	0.242	0.159	-0.242	2.935	0.000
B7	3.578	1.249	0.204	0.128	-0.204	2.469	0.000
B8	3.585	1.308	0.216	0.140	-0.216	2.623	0.000
Benefit 1	4.252	0.882	0.292	0.198	-0.292	3.535	0.000
Benefit 2	2.558	1.092	0.226	0.226	-0.155	2.738	0.000
Benefit 3	3.898	1.012	0.248	0.138	-0.248	3.003	0.000
Benefit 4	3.061	0.769	0.287	0.287	-0.244	3.477	0.000
Benefit 5	2.095	0.975	0.267	0.267	-0.175	3.235	0.000
Benefit 6	1.980	0.780	0.224	0.224	-0.211	2.719	0.000
Benefit 7	1.293	0.664	0.493	0.493	-0.330	5.981	0.000

Table 16. **Table of equivalences – Research's hypotheses tests**

(Source: author)

Term	Type	Equivalence
Benefit 1	Benefit	Improvement of company's corporate image
Benefit 2	Benefit	Improvement of relationship with stakeholders
Benefit 3	Benefit	Legal compliance
Benefit 4	Benefit	Improvement of company's environmental performance (i.e. reduction of pollution)
Benefit 5	Benefit	Reduction of resource consumption (Water, energy, etc.)
Benefit 6	Benefit	Increase in productivity
Benefit 7	Benefit	Financial gains
B1	Barrier	Implementation's cost
B2	Barrier	Operational cost (Post-Implementation)
B3	Barrier	Doubts regarding the benefits of the standard
B4	Barrier	Lack of commitment from staff
B5	Barrier	Lack of commitment from top management
B6	Barrier	Lack of adequate competencies for the implementation of the Environmental Management System
B7	Barrier	Amount of documentation required for the implementation
B8	Barrier	Complexity of the implementation
M1	Motivation	Socially Responsible Behavior
M2	Motivation	Improvement of company's environmental performance
M3	Motivation	Improvement of company's corporate image
M4	Motivation	Legal compliance
M5	Motivation	Pressure from external stakeholders
M6	Motivation	Foreign Investment
M7	Motivation	Potential economic efficiencies derived from the standard

Table 17. **Backup data from first set of tests - Motivations**

(Source: author)

Benefit Tested	Summary		ANOVA	Coefficients							
	R	R Square	Sig.	(Constant)	M1	M2	M3	M4	M5	M6	M7
Benefit 1	,541[a]	,292	,000[b]	1,539	,164	,148	,436	,066	,151	-,812	,112
Benefit 2	,421[a]	,177	,000[b]	-2,206	,810	,262	,030	,509	-,044	-,643	,025
Benefit 3	,603[a]	,363	,000[b]	0,827	-,298	,361	,173	,573	,061	-,161	-,130
Benefit 4	,676[a]	,457	,000[b]	-0,203	,278	,517	-,123	,332	,072	-,894	,549
Benefit 5	,406[a]	,165	,001[b]	0,681	-,275	,379	-,051	,101	,265	-,215	,374
Benefit 6	,332[a]	,110	,021[b]	1,404	-,178	,281	,032	,058	-,122	-,202	,253
Benefit 7	,520[a]	,271	,000[b]	0,915	-,067	-,201	-,045	-,026	,334	,224	,391

Table 18. **Backup data from first set of tests - Barriers**

(Source: author)

Benefit Tested	Summary		ANOVA	Coefficients								
	R	R Square	Sig.	(Constant)	B1	B2	B3	B4	B5	B6	B7	B8
Benefit 1	,490[a]	,240	,000[b]	2,879	,244	,095	,033	-,221	,201	-,271	,030	,237
Benefit 2	,337[a]	,113	,031[b]	2,609	,083	,004	,011	-,115	-,201	,141	-,111	,206
Benefit 3	,400[a]	,160	,002[b]	2,291	,113	,251	,089	-,225	,166	,097	-,221	,099
Benefit 4	,485[a]	,235	,000[b]	1,826	,256	-,131	-,144	-,099	,183	,396	-,062	-,010
Benefit 5	,445[a]	,198	,000[b]	-0,215	,086	,116	,127	,165	-,068	,215	-,192	,147
Benefit 6	,600[a]	,360	,000[b]	-0,199	,218	-,115	,228	,250	-,092	-,017	-,027	,128
Benefit 7	,442[a]	,195	,000[b]	0,084	,120	,203	,043	,000	,040	-,076	-,059	,021

Table 19. **Backup data from fourth set of tests**

(Source: author)

Benefit Tested		Benefit 1	Benefit 2	Benefit 3	Benefit 4	Benefit 5	Benefit 6	Benefit 7
Summary	R	,680[a]	,517[a]	,706[a]	,781[a]	,652[a]	,705[a]	,750[a]
	R Square	,463	,268	,498	,609	,425	,496	,562
ANOVA	Sig.	,000[b]	,000[b]	,000[b]	,000[b]	,000[b]	,000[b]	,000[b]
Coefficients	(Constant)	,809	-1,774	-1,263	-1,679	-3,183	-1,474	,604
	M1	,178	,941	-,239	,229	-,087	-,243	,055
	M2	,012	-,173	,263	,571	,478	,442	-,477
	M3	,443	,174	,202	-,087	,143	,049	-,085
	M4	,015	,514	,593	,353	,227	,158	-,017
	M5	,056	-,135	-,149	,128	,066	-,094	,114
	M6	-,766	-,197	-,127	-,862	-,692	-,476	,549
	M7	,097	,101	,003	,513	,461	,045	,638
	B1	,182	,067	,074	,090	-,054	,142	,133
	B2	,107	,046	,276	-,065	,184	-,109	,349
	B3	-,039	-,079	,104	-,136	,114	,288	-,103
	B4	-,171	-,073	-,203	-,027	,222	,273	-,005
	B5	,236	-,271	,126	,224	-,039	-,036	-,127
	B6	-,233	,163	,188	,399	,264	-,012	-,002
	B7	-,067	-,140	-,120	-,010	-,168	,025	-,054
	B8	,371	,213	,100	-,150	,095	,093	,013

Table 20. **Backup data from fifth set of tests**

(Source: author)

Benefit Tested	Summary		ANOVA	Coefficients - Motivation Construct 1					
	R	R Square	Sig.	(Constant)	M1	M2	M3	M4	M6
Benefit 1	,527[a]	,278	,000[b]	1,461	,239	,157	,465	,134	-,898
Benefit 2	,420[a]	,177	,000[b]	-2,147	,786	,263	,023	,499	-,627
Benefit 3	,598[a]	,357	,000[b]	0,686	-,263	,354	,178	,571	-,167
Benefit 4	,513[a]	,263	,000[b]	0,070	,303	,552	-,093	,447	-1,02
Benefit 5	,291[a]	,085	,027[b]	0,654	-,146	,405	,005	,250	-,395
Benefit 6	,268[a]	,072	,059[b]	1,681	-,248	,296	,020	,060	-,188
Benefit 7	,244[a]	,060	,120[b]	0,831	,097	-,173	,023	,149	,011
Benefit Tested	Summary		ANOVA	Coefficients - Motivation Construct 2					
	R	R Square	Sig.	(Constant)	M5	M7			
Benefit 1	,263[a]	,069	,006[b]	3,274	,319	,199			
Benefit 2	,151[a]	,023	,189[b]	1,959	,309	-,058			
Benefit 3	,104[a]	,011	,458[b]	3,486	,111	,120			
Benefit 4	,502[a]	,252	,000[b]	1,791	,231	,547			
Benefit 5	,329[a]	,108	,000[b]	1,017	,207	,446			
Benefit 6	,248[a]	,062	,010[b]	1,873	-,147	,308			
Benefit 7	,489[a]	,239	,000[b]	0,084	,292	,407			
Benefit Tested	Summary		ANOVA	Coefficients - Barrier Construct 1					
	R	R Square	Sig.	(Constant)	B6	B7	B8		
Benefit 1	,296[a]	,087	,004[b]	4,750	-,375	,126	,113		
Benefit 2	,226[a]	,051	,057[b]	1,976	,077	-,102	,187		
Benefit 3	,144[a]	,021	,391[b]	4,273	,013	-,129	,011		
Benefit 4	,295[a]	,087	,005[b]	2,400	,313	-,022	-,109		
Benefit 5	,353[a]	,124	,000[b]	1,132	,318	-,145	,092		
Benefit 6	,264[a]	,070	,016[b]	1,251	,123	,030	,048		
Benefit 7	,192[a]	,037	,145[b]	1,702	-,060	,008	-,062		
Benefit Tested	Summary		ANOVA	Coefficients - Barrier Construct 2					
	R	R Square	Sig.	(Constant)	B3	B4	B5		
Benefit 1	,315[a]	,100	,002[b]	4,045	,104	-,261	,169		
Benefit 2	,233[a]	,054	,046[b]	3,464	,101	-,025	-,310		
Benefit 3	,229[a]	,052	,052[b]	3,534	,090	-,209	,176		
Benefit 4	,017[a]	,000	,998[b]	3,087	-,011	,011	-,003		
Benefit 5	,343[a]	,117	,000[b]	0,898	,185	,247	-,141		
Benefit 6	,513[a]	,263	,000[b]	0,459	,293	,263	-,197		
Benefit 7	,119[a]	,014	,566[b]	0,939	,032	-,043	,089		
Benefit Tested	Summary		ANOVA	Coefficients - Barrier Construct 3					
	R	R Square	Sig.	(Constant)	B1	B2			
Benefit 1	,306[a]	,094	,001[b]	3,106	,210	,102			
Benefit 2	,044[a]	,002	,868[b]	2,701	,012	-,045			
Benefit 3	,275[a]	,076	,003[b]	2,632	,074	,244			
Benefit 4	,271[a]	,074	,004[b]	2,951	,163	-,109			
Benefit 5	,128[a]	,017	,302[b]	1,664	-,017	,119			
Benefit 6	,252[a]	,064	,009[b]	1,815	,158	-,093			
Benefit 7	,406[a]	,165	,000[b]	0,010	,128	,203			

Table 21. **Equations from fifth set of tests**

(Source: author)

Test	Linear Regression Equations
Motivations Construct 1	Benefit1 = 1,461+0,239*(M1)+0,157*(M2)+0,465*(M3)+0,134*(M4)-0,898*(M6)
	Benefit2 = (-2,147)+0,786*(M1)+0,263*(M2)+0,023*(M3)+0,499*(M4)-0,627*(M6)
	Benefit3 = 0,686-0,263*(M1)+0,354*(M2)+0,178*(M3)+0,571*(M4)-0,167*(M6)
	Benefit4 = 0,070-0,303*(M1)+0,552*(M2)-0,093*(M3)+0,447*(M4)-1,015*(M6)
	Benefit5 = 0,654-0,146*(M1)+0,405*(M2)-0,005*(M3)+0,250*(M4)-0,395*(M6)
	Benefit6 = 1,681-0,248*(M1)+0,296*(M2)-0,020*(M3)+0,060*(M4)-0,188*(M6)
	Benefit7 = 0,831-0,097*(M1)-0,173*(M2)-0,023*(M3)+0,149*(M4)-0,011*(M6)
Motivations Construct 2	Benefit1 = 3,274+0,319*(M5)+0,199*(M7)
	Benefit2 = 1,959+0,309*(M5)-0,058*(M7)
	Benefit3 = 3,486+0,111*(M5)+0,120*(M7)
	Benefit4 = 1,791+0,231*(M5)+0,547*(M7)
	Benefit5 = 1,017+0,207*(M5)+0,446*(M7)
	Benefit6 = 1,873-0,147*(M5)+0,308*(M7)
	Benefit6 = 0,084-0,292*(M5)+0,407*(M7)
Test	**Linear Regression Equations**
Barriers Construct 1	Benefit1 = 4,750-0,375*(B6)+0,126*(B7)+0,113*(B8)
	Benefit2 = 1,976+0,077*(B6)-0,102*(B7)+0,187*(B8)
	Benefit3 = 4,273+0,013*(B6)-0,129*(B7)+0,011*(B8)
	Benefit4 = 2,400+0,313*(B6)-0,022*(B7)-0,109*(B8)
	Benefit5 = 1,132+0,318*(B6)-0,145*(B7)+0,092*(B8)
	Benefit6 = 1,251+0,123*(B6)+0,030*(B7)+0,048*(B8)
	Benefit7 = 1,702-0,060*(B6)+0,008*(B7)-0,062*(B8)
Barriers Construct 2	Benefit1 = 4,045+0,104*(B3)-0,261*(B4)+0,169*(B5)
	Benefit2 = 3,464+0,101*(B3)-0,025*(B4)+0,310*(B5)
	Benefit3 = 3,534+0,090*(B3)-0,209*(B4)+0,176*(B5)
	Benefit4 = 3,087-0,011*(B3)+0,011*(B4)-0,003*(B5)
	Benefit5 = 0,898+0,185*(B3)+0,247*(B4)-0,141*(B5)
	Benefit6 = 0,459+0,293*(B3)+0,263*(B4)-0,197*(B5)
	Benefit6 = 0,939+0,032*(B3)-0,043*(B4)+0,089*(B5)
Barriers Construct 3	Benefit1 = 3,106+0,210*(B1)+0,102*(B2)
	Benefit2 = 2,701+0,012*(B1)-0,045*(B2)
	Benefit3 = 2,632+0,074*(B1)+0,244*(B2)
	Benefit4 = 2,951+0,163*(B1)-0,109*(B2)
	Benefit5 = 1,664-0,017*(B1)+0,119*(B2)
	Benefit6 = 1,815+0,158*(B1)-0,093*(B2)
	Benefit7 = 0,010+0,128*(B1)+0,203*(B2)