

## Analyze Of Enviromental Discolsure Within European Union Countries

**Author:** Ienciu Ionel-Alin, Babeş-Bolyai University, alinienciu@yahoo.co.uk

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*The research is conducted as an empirical study which explains how environmental disclosure varies across European countries and reflects factors that explain this variation at the European Union level. The paper identifies and analyze five factors that explain the varies of environmental disclosure across European Union Countries: strength of auditing and accounting standards, government mandated disclosure of environmental performance and pollutant release, development, number of companies which had implemented ISO 14001/EMAS, eco-label awards obtained by companies within the country, environmental performance. After the empirical and theoretical analyze we can conclude that the introduction of mandatory environmental disclosure is the most efficient way to increase the quantity and the quality of environmental disclosure at the European Union level. This study is not a research of some particular entities regarding environmental disclosure. The paper discusses environmental disclosure as an average of all the environmental disclosure of all the entities within a European Union country. The paper is of interest to anyone involved in the process of environmental disclosure, either as entity or other user of environmental information's.*

**Keywords:** *environmental disclosure, European Union, mandated disclosure, audit and accounting standards, environmental performance, environmental regulations, ISO 14001/EMAS, eco-label awards, development*

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### Introduction

Industrial development, whilst credited with contributing to economic and technological progress, has been criticised for creating greater environmental impacts, and calls have been made for greater responsibility by businesses. Companies are being urged to become accountable for their environmental impacts (Hackston and Milne, 1996). During the last decade,

the demand for environmental reporting has increased dramatically within the stock listed companies (Beretta and Bozzolan, 2004). A wide range of stakeholders such as shareholders are interested in corporate environmental performance and its disclosure. Financial institutions such as banks and insurance companies have become interested in appraising corporate environmental risk and performance when they invest money (Lee *et al.*, 2002). In response, many corporations have begun to report their eco-friendly activities and environmental performance. Such environmental disclosure can either be included in the financial statements (balance sheet, profit and lost account), in the notes to the financial statements, in annual reports or in sepeated environmental or sustenability report.

However, in the absence of environmental accounting standards, the stakeholders are forced to rely on only on voluntary environmental reporting (Larrinaga-Gonzalez *et al.*, 2002) which varies across companies, countries and continents. A large number of studies analyze the time and space variation of the environmental reporting, emphasizing the factors which are determinant for environmental reporting (Buhr and Freedman, 2001; Larrinaga *et al.*, 2002; Deegan *et al.*, 2002; O'Donovan, 2002; Holland and Foo, 2003; Cormier *et al.*, 2005; Frost, 2007; Taylor and Shan, 2007; Sumiani *et al.*, 2007).

In this study we have revealed how environmental disclosure varies across European countries. Using results from an international survey publish by World Bank we've analysed the differences between European countries regarding environmental disclosure by connecting corporate environmental disclosures with variables such as strength of auditing and accounting standards, government mandated disclosure of environmental performance and pollutant release, level of development, number of eco-label awards obtained by companies within the country, number of companies within a county which had implemented ISO 14001 or EMAS. Taking into consideration the results of some studies which indicate that environmental reporting is not related to corporate environmental performance (Ingram and Frazier, 1980; Wiseman, 1982; Rockness, 1985) we've compared the level of environmental disclosure with the level of environmental performance within a country in order to see if corporate environmental disclosure is reflecting environmental performance.

## Literature Review

A review of the relevant literature reveals that corporate environmental reporting has received attention by researchers and professionals for many years. Examples include Wiseman (1982), Guthrie and Parker (1990), Harte and Owen (1991), Gamble *et al.* (1995), Gray *et al.* (1995), Gamble *et al.* (1996), Fekrat *et al.* (1996), Deegan and Rankin (1996), Brown and Deegan (1998), Neu *et al.* (1998), Adams *et al.* (1998), Perry and Teng (1999), Richardson *et*

*al.* (1999), Larrinaga-Gonzalez *et al.* (2002), Deegan *et al.* (2002), O'Donovan (2002), Holland and Foo (2003), Gray and Milne (2004), Murray *et al.* (2006), Frost (2007), Yamamoto *et al.* (2007), Aerts *et al.* (2009) and others. Empirical studies on environmental reporting and disclosures have focused on both industrialised countries and developing countries. Most of the studies analysed the disclosure of environmental information in the context of developed countries: Solomon and Lewis (2002), O'Dwyer (2002), and only a few papers discussed this issue in the developing world context: Ite (2004). Some of these have been longitudinal studies of reporting practices in a single country others have attempted to provide comparative analyses between countries. Our study continues this analyse by examining the differences in reporting environmental issues between European countries in order to identify the variables that explain this differences.

Yamamoto *et al.* (2007) study the discretionary disclosure of the environmental information practiced using companies that work in Latin America and South Africa. This study showed Brazil as the host country of the largest number of companies with high disclosure items, followed by South Africa and Peru. In a segregated analysis Mexican firms outperformed their Brazilian peers in terms of disclosure, although there were only three group Mexican companies in the sample. The Bolivian firm presented the highest score among all companies in 2005. The authors suggest that a solution to increase the environmental disclosure in developing countries is to make it mandatory through specific regulation.

Yusoff and Lehman (2006) studied the differences of the environmental disclosure of the top 50 companies in Australia and Malaysia regarding the factors influencing the environmental disclosure decision of the analysed companies. They conclude a better and higher environmental disclosure in the Australian companies because Australian regulation regarding environmental issues is better than the Malaysian's one. They also point that in Malaysia only the positive points regarding environmental disclosure is reflected while in Australia either positive or negative results are disclosed.

Holland and Foo (2003) examine current corporate environmental reporting practices within UK and US annual reports and suggest that elements of the legal and regulatory framework of each country which regulate environmental activity determine the types of disclosures made, and so influence environmental performance.

A study exploring some of the underlying conditions for differences in disclosure in Canadian and US companies (Buhr and Freedman, 2001) found that the type of disclosure—mandatory and voluntary—followed from the context in which the companies operated. Hence in Canada voluntary disclosure was higher and reflected the collectivist nature of Canadian society reporting in the US appeared to follow the requirements of the legislature and higher levels of mandatory disclosure were seen in US company's annual

reports.

Christofi *et al* (2012) consider that the Securities and Exchange Commission (SEC) and Financial Accounting Standards Board (FASB) should become actively involved in standardization and enforcement of corporate socio-environmental disclosures because investors have neither rewarded nor penalized firms for adhering to or violating sustainability matters in their corporate decisions.

Ribeiro and Aibar-Guzman (2010) analysing the extent to which Portuguese local entities have implemented a set of environmental accounting practices conclude that the existence of compulsory environmental accounting standards is not positively associated with the development of environmental accounting practices by Portuguese local entities.

Stittle *et al.* (1997) state as a conclusion of their study that in spite of the similarity between regulations (both UNE and BS 7750 conform to the EU regulations), in reality the extent and quality of this information varies considerably between companies and between countries. Differences can be seen between the UK and Spain due to the degree of variety in the development of the way that environmental issues are perceived and also from within the economic and legal systems.

Nyquist (2003) compared the legislation in Denmark, Norway and Sweden concerning what kind of information firms must disclose. He concluded that these countries have great similarities regarding accounting legislation and standards. However Denmark has chosen a different way to force entities to disclose environmental performance. In Denmark entities must deliver separate green accounts while Norwegian and Swedish entities are bound to report environmental issues in the administrative report. The objective of the Danish and Norwegian legislation is to stimulate entities' environmental improvements.

Larrinaga-Gonzalez *et al.* (Larrinaga-Gonzalez *et al.*, 2002) analyse the Spanish environmental disclosure standard. They concluded that the regulation of environmental reporting would prevent all the shortcomings of voluntary environmental disclosure. Regulation is not sufficient for the advancement of environmental accountability. We conjecture that an institutional reform would need at least a discursive dialogue in the development of regulation and an effective enforcement of legislation.

Acerete *et al.* (2011) analyze the extent to which Spanish concessionaires of toll motorways have adopted accounting reporting standards that provide environmental information. The results indicate a minimum level of quality in the environmental information provided and a low level of disclosure of the elements required by the standards. The authors consider that the main driver of the increase in disclosures is the need for compliance with accounting regulations, rather than any change in the attitude of concessionaires toward environmental reporting.

Jorgensen and Sodorstrom (2006) investigate how environmental accounting varies under commercial and environmental laws across countries. They find evidence that 'legal institutions affect managers' reports of corporate environmental disclosure. Environmental disclosure and disclosure regulations are codetermined that is across countries, reported environmental disclosure vary with legal institution, environmental regulation and disclosure regulation.

All this studies had enforced us to see the differences regarding environmental disclosure from the eye of the accounting regulation system, the voluntary of mandatory disclosure of environmental performance and other factors which will be presented in the next section.

## **Research Methodology**

The study represents an empirical research that uses archival data as the primary source of data. The advantages of the archival data consist in the fact that archival data are less subjective than dates obtained by researcher when conducting content analyses or applying surveys. These archival data helped us to present the level of variables used in a comparative way for a sample of 27 countries from European Union. The main argument for choosing European Union countries as sample of this research is that European Union countries have to promote the same environmental policy and have to implement common environmental instruments.

We've analysed the correlations between corporate environmental disclosure as the dependent variable and the independent variables including strength of auditing and accounting standards, government mandated disclosure of environmental performance and pollutant release, development, number of companies which had implemented ISO 14001/EMAS, eco-label awards obtained by companies within the country, environmental performance.

### ***Data used***

In Table 1 we present the variables used. The Global Competitiveness Report for 2005 - 2006 is the main data source used for determining the level of the variable analysed (prevalence of corporate environmental reporting, strength of auditing and accounting standards, governmental-mandated disclosure of environmental performance and pollutant release, Gross Domestic Product) within different countries from Europe. The Global Competitiveness Report series has involved over the last three decades into the world's most comprehensive and respected assessment of country's competitiveness, offering invaluable insights into the policies, institutions, and factors driving productivity and, thus, enabling sustained economic growth and long-term prosperity. Produced in collaboration with leading academics and a global network of research institutes, The Global Competitiveness Report provides

users with a comprehensive dataset on a broad array of competitiveness indicators for a large number of industrialized and developing economies. Besides hard data from leading international sources, these indicators include the results of the Executive Opinion Survey carried out by the World Economic Forum annually. The Survey captures the perceptions of several thousands business leaders across the countries covered on topics related to national competitiveness ([www.gcr.webforum.org](http://www.gcr.webforum.org)).

Along with this Global Competitiveness Report the data used have been taken from the World bank website ([www.worldbank.org](http://www.worldbank.org)), from the European Commission Eurostat website (<http://epp.eurostat.ec.europa.eu>), from the United Nation Statistics Division website (<http://unstats.un.org>), from International Energy Agency website ([www.iea.org](http://www.iea.org)) from Pilot 2006 Environmental Performance Index and from United Nations Conference on Trade and Development website ([www.unctad.org](http://www.unctad.org)). From these sources we could determine the environmental performance within a country, factors reflecting the economic healthy of a country (development) or other elements important regarding the differences of corporate environmental disclosure (eco-label awards obtain, number of companies which had implemented ISO 14001/EMAS). The variables were selected from the period 2005-2006.

### ***Variable description***

In this paper we've tried to explain the variation of corporate environmental disclosure within European countries so we chose the corporate environmental disclosure as the determine variable of the study.

#### *The prevalence of corporate environmental disclosure (CED)*

Corporate environmental disclosure, according to stakeholder theory, represent the environmental information which is disclosed voluntarily by companies is a response to the existence of users who are legitimately interested in the behaviour of the company and who compete with traditional users (Freeman, 1984; Roberts, 1992; Fekrat *et al.*, 1996). The main variable "Prevalence of corporate environmental reporting" represent the question 10.10 in the Global Competitiveness Report 2004-2005 survey and question 9.09 in the Global Competitiveness Report 2005-2006 survey. It was noted in the survey with a mark from 1 to 7. Number 1 attached to the variable represent the fact that the corporate environmental disclosure in that country in nonexistent. Number 7 represents the fact that the level of the corporate environmental disclosure in that country is widespread.

We consider that these differences could be explained by variables like: strength of auditing and accounting standards, governmental-mandated disclosure of environmental performance and pollutant release, level of development, eco-label awards obtained by companies within the country, the number of companies which had implemented ISO 14001/EMAS environmental

performance.

*The strength of auditing and accounting standards (SAA)*

This first codetermine variable analysed "Strength of auditing and accounting standards" is considered by many empirical studies to be the factor that determines the financial reporting, the accounting and auditing regulation within a country. The variable is question 9.24 in the Global Competitiveness Report 2005-2006 survey and it was noted with a mark from 1 = nonexistent (which represents the fact that the auditing and accounting standards don't exist in that country) to 7 = widespread (which suggests that the auditing and accounting standards are at the highest level).

*The governmental-mandated disclosure of environmental performance and pollutant release (GME)*

The second codetermine variable governmental-mandated disclosure of environmental performance and pollutant release is referring to the fact that the disclosure of environmental information within a country can be voluntary and mandated. In some countries there are some specific mandated elements regarding environmental disclosure, in some countries there are totally voluntary. Also this factor was chosen as a codetermine variable as it was suggested by many empirical studies we've presented in the literature review. The variable is question 10.05 in the Global Competitiveness Report 2004-2005 survey and question 9.03 in the Global Competitiveness Report 2005-2006 survey and it was noted with a mark from 1 = nonexistent (which represents the fact that the disclosure of environmental performance and pollutant release is voluntary, there aren't mandatory environmental information) to 7 = widespread (which suggests that the disclosure of environmental performance and pollutant release is mandatory and it reached the highest level).

*Level of development (DEV)*

This codetermine variable was taken from the Global Competitiveness Report 2004-2005. This variable reflects the economical health of a country. So we analysed if the economical health represents a factor that determines the level environmental responsiveness and environmental disclosure of information. For this we've divided European countries in developing, developed and underdeveloped considering the division made by World Bank ([www.worldbank.org](http://www.worldbank.org)) representative for our study.

*Eco-label awards obtained by companies within the country (EcoA)*

This indicator is defined as the number of eco-label or "EU flower" awards in EU Member States. The Community eco-label is awarded to products and services with reduced environmental impacts and is administered by the European Eco-labelling Board (EUEB).

*Number of companies which had implemented ISO 14001 or EMAS (ISO-EMAS)*

Is an indicator that reflects the number of entities that have implemented environmental management systems such as ISO 14001, that the EMAS, systems designed to improve the management and monitoring of environmental performance in an entity. The worldwide ISO14001/EMAS statistical numbers were collected by Reinhard Peglau, c/o Federal Environmental Agency from Germany from the interested people throughout the world and subjected to a schematic process to show the graph by Corporate Risk Management.

*Environmental Performance Index (EPI)*

Represents an index composed of 17 indicators from six categories: environmental health, air quality, water resources, natural resources, biodiversity, sustainable energy, which represent the environmental performance within a country. The main factor that influences the environmental performance within a country is the economic activity of the entities that activate in that country, the main source of pollution and resource degradation. The indicator was selected from Pilot 2006 Environmental Performance Index and is marked between 0 and 100, which represent the highest scor of environmental performance within a country.

The description of the dependent and independent variables is presented in table 1:

**Table 1.** Descriptive analysis

|                    |    | N         | Minimum   | Maximum   | Mean      | Std. Deviation |            |
|--------------------|----|-----------|-----------|-----------|-----------|----------------|------------|
|                    |    | Statistic | Statistic | Statistic | Statistic | Std. Error     | Statistic  |
| CED                | 27 | 2.50      | 5.90      | 4.3852    | .18877    | .18877         | .98086     |
| GME                | 27 | 2.80      | 6.20      | 4.6556    | .17166    | .17166         | .89199     |
| SAA                | 27 | 3.70      | 6.60      | 5.2407    | .14919    | .14919         | .77522     |
| DEV                | 27 | 2.00      | 3.00      | 2.7037    | .08955    | .08955         | .46532     |
| EMS                | 27 | 6.00      | 12048.00  | 2118.2963 | 630.99839 | 630.99839      | 3278.76382 |
| EcoA               | 27 | .00       | 95.00     | 12.7778   | 4.16310   | 4.16310        | 21.63212   |
| EPI                | 27 | 56.90     | 87.80     | 79.9704   | 1.13599   | 1.13599        | 5.90279    |
| Valid N (listwise) | 27 |           |           |           |           |                |            |

**Hypothesis**

Each hypothesis represents our personal view regarding the connection between the determine variable and each codetermine variable. Some of the correlation was suggested by empirical studies some of them were analyzed and presented for the first time within this study.

**H<sub>1</sub>:** *The strength of auditing and accounting standards influences the level of prevalence of corporate environmental reporting.* This correlation was suggested by many studies presented in the literature review section. The accounting and auditing regulation within a country gives the strength to disclose information within the companies which are representative for that country. Countries in which accounting and audit standards are well implemented the amount and quality of information reported by companies is high level and also the environmental information are better disclose in bough quantitative and qualitative terms.

The motivation underlying the formulation of the first hypothesis is that transparency on preventing errors and fraud in the private sector is essential for business and can be obtained by using accounting practices and auditing standards to ensure the access to information. Although European Directives and International Standards of Accounting present deficiencies in reporting environmental issues, they have recently passed through standards (IFRS 6), interpretations of standards (IFRIC 1, IFRIC 5, IFRIC 6) or various guidelines and recommendations (EC Recommendation 2001/453) which encourage corporate environmental reporting. Jorgensen and Sodorstrom (Jorgensen and Sodorstrom, 2006) analyzing how environmental reporting varies between countries argue that environmental reports are determined by the degree of implementation and enforcement of accounting and auditing standards.

**H<sub>2</sub>:** *The governmental-mandated disclosure of environmental performance and pollutant release influences the level of prevalence of corporate environmental reporting.* Countries with a high level of governmental-mandated disclosure of environmental performance and pollutant release have also high level of prevalence of corporate environmental reporting. Governmental-mandated rules regarding disclosure determine companies to disclose more. In countries were the disclosure rules are voluntary companies disclose less because there are factors like costs, non transparency of negative aspects and others which determine companies to disclose in the limit of the regulations. Mandatory environmental reports are considered by many researchers as a way to increase the accountability of an entity (Deegan and

Rankin, 1996; Holland and Foo, 2003; Frost, 2007; Yamamoto *et al.*, 2007). Lee and Hutchison (2005) considers that without laws and regulations, disclosures are unlikely to be uniform and comparable across firms.

**H3:** *The economical strength of a country influences the prevalence of corporate environmental reporting.* We analyzed if developed countries have a higher level of prevalence of corporate environmental reporting than developing countries. Developed countries have more financial resources those developing countries so the environmental protection has to benefit from this. Developed countries are countries where many environmental theories were born and countries where companies are consider by many practitioners and academicians more environmental friendly. Studies have shown that entities with high financial performance present high level of environmental disclosure (Richardson *et al.*, 1999; Gray and Milne, 2004, Murray *et al.*, 2006).

**H4:** *Also we tried to see if countries which are consider more environmental friendly taking into account variables like the number of eco-label awards obtained by companies, the number of companies implementing ISO 14001 or EMAS.* These variables reflect in some way the ethical behavior of the entities within a country which leads us to the legitimacy theory based on the idea that to be successful entities must act within the limits of what society identifies as ethical behavior (Deegan *et al.*, 2002; O'Donovan, 2002; Aerts *et al.*, 2009). So we assume that a country in which the number of eco-label awards obtained by companies is higher is considered to be more environmental friendly and so the level of prevalence of corporate environmental reporting should be high. Also we consider that companies with ISO 14001/EMAS standards are environmental friendly so they disclose more environmental information than other companies.

**H5:** *Corporate environmental performance is reflecting the truth and fair view regarding environmental issues.* So we assume that environmental reporting is related to corporate environmental performance and countries in which the level of pollution is high have to disclose more information that countries in which the level of pollution is low because they have more environmental information to disclose. To analyze this hypothesis we correlate the corporate environmental reporting with environmental performance within a country. There have been numerous studies that have shown the existence and absence of connections between environmental reporting and environmental performance of the entities (Fekrat *et al.*, 1996; Brown and Deegan, 1998; Neu *et al.*, 1998).

## Data Analysis Results

Using the considered variables we estimate a general linear model that could explain environmental reporting variation for the European Union countries as:

$$CED = \lambda_i + \beta_1 * GME + \beta_2 * SAA + \beta_3 * DEV + \beta_4 * EcoA + \beta_5 * ISO-EMAS + \beta_6 * EPI + \epsilon_i$$

where:

$\lambda_i$  = constant

$\beta_i$  = model coefficients

CED = the prevalence of corporate environmental disclosure

GME = the governmental-mandated disclosure of environmental performance and pollutant release

SAA = the strength of auditing and accounting standards

DEV = level of development

EcoA = eco-label awards obtained by companies within the country

ISO-EMAS = number of companies which had implemented ISO 14001 or EMAS (ISO-EMAS)

EPI = Environmental Performance Index

$\epsilon_i$  = error term

The correlation between variables was tested using the software SPSS version 17.0 and the obtained results are presented in the below table.

**Table 2.** Correlations table

|                        |      | CED   | GME   | SAA   | DEV   | EMS   | EcoA  | EPI   |
|------------------------|------|-------|-------|-------|-------|-------|-------|-------|
| Pearson<br>Correlation | CED  | 1.000 | .928  | .795  | .411  | .230  | .217  | .445  |
|                        | GME  | .928  | 1.000 | .732  | .393  | .230  | .269  | .586  |
|                        | SAA  | .795  | .732  | 1.000 | .472  | .017  | -.023 | .511  |
|                        | DEV  | .411  | .393  | .472  | 1.000 | .321  | .375  | .480  |
|                        | EMS  | .230  | .230  | .017  | .321  | 1.000 | .618  | .095  |
|                        | EcoA | .217  | .269  | -.023 | .375  | .618  | 1.000 | .187  |
|                        | EPI  | .445  | .586  | .511  | .480  | .095  | .187  | 1.000 |

|                 |      |      |      |      |      |      |      |      |
|-----------------|------|------|------|------|------|------|------|------|
| Sig. (1-tailed) | CED  | .    | .000 | .000 | .017 | .125 | .138 | .010 |
|                 | GME  | .000 | .    | .000 | .021 | .124 | .088 | .001 |
|                 | SAA  | .000 | .000 | .    | .006 | .466 | .455 | .003 |
|                 | DEV  | .017 | .021 | .006 | .    | .051 | .027 | .006 |
|                 | EMS  | .125 | .124 | .466 | .051 | .    | .000 | .318 |
|                 | EcoA | .138 | .088 | .455 | .027 | .000 | .    | .175 |
|                 | EPI  | .010 | .001 | .003 | .006 | .318 | .175 | .    |

The above table suggests a very strong correlation between prevalence of corporate environmental reporting and governmental-mandated disclosure of environmental performance and pollutant release. Countries that have a high level of governmental-mandated disclosure of environmental performance and pollutant release have also a high level of prevalence of corporate environmental reporting. We can validate the hypothesis and conclude that changes in national regulations regarding environmental reporting can be very useful in explaining the quality and quantity of environmental information reported. However environmental reports are ambiguous and remain in many cases at the discretion of management even in the most sensitive sectors that affect the environment.

Accounting and auditing standards do not give a particular importance of environmental issues, they are insufficient to reflect fairly the entity's environmental impact but the consistent application of these help to increase reporting in general and so the environmental reporting in particular.

With some exceptions such as Malta which, although it is considered a developed country has the lowest level of environmental reporting, most developed countries have a high level of environmental reporting.

From the distribution map we cannot find any correlation between corporate environmental reporting and the number of eco-label awards obtained by companies within a country. The relation can be identifying in about 40% of the countries which we consider very low level so the hypothesis cannot be validated. Exceptions can be identifying in the case of Greece, Italy and others. This are countries were although the level of environmental disclosure is middle the number of companies which are consider to be environmental friendly is high.

Although implementing ISO 14001 or EMAS is a factor the increase environmental disclosure within a company we cannot find any linear

function between them at a country level. The number of entities that have implemented management systems (ISO14001/EMAS) is not a determinant factor of corporate environmental reporting. There are exception like Italy and Spain there the number of companies implementing ISO 14001 standard is high but the prevalence of corporate environmental reporting is not very high. These could be explained by the high level of CO<sub>2</sub> emissions which determine companies to implement environmental standards like ISO 14001 or EMAS to be more environmental friendly.

Although we can see that countries with the level of corporate environmental reporting higher than 4 levels are countries with many sustainability-satisfying companies we cannot define a linear correlation between these variables.

The middle intensity indirect correlation between environmental performance and level of corporate environmental reporting determine us to say that entities with low environmental performance disclose more information regarding environmental impact. This can be explained from the point of view of the legitimacy theory, by the benefits which are created by reporting aspects regarding environmental impact for the stakeholders of information, justifying them self's for the low environmental performance.

Thus, the correlations between independent variables and the disclosure index are significant at the 1 per cent level for the governmental-mandated disclosure of environmental performance and pollutant release (*GME*), the strength of auditing and accounting standards (*SAA*) and Environmental Performance Index (*EPI*). A new model was estimated and the assumptions underlying the regression model were tested again. The adjusted R<sup>2</sup> of 0.900 is acceptable for this type of analysis and the model is statistically significant (*p* value = 0.025). The results confirm three hypotheses: H<sub>1</sub>, H<sub>2</sub> and H<sub>5</sub>, the other hypotheses being rejected. So, the companies with the governmental-mandated disclosure of environmental performance and pollutant release, with the strength of auditing and accounting standards and with low environmental performance index disclose more corporate environmental information.

The analysis between the considered variables, based on equation (1) is presented in the following table:

**Table 3.** Regression results

|            | Coefficients ( $\beta$ ) | t - value | p value | VIF   |
|------------|--------------------------|-----------|---------|-------|
| (Constant) | 0.732                    | 0.847     | 0.406   |       |
| GME        | 0.913                    | 8.486     | 0.000   | 2.484 |
| SAA        | 0.356                    | 3.056     | 0.006   | 2.205 |
| EPI        | -0.031                   | -2.395    | 0.025   | 1.557 |

**Notes:** Model summary:  $R = 0.955$ ,  $R^2 = 0.911$ , adjusted  $R^2 = 0.900$ ,  $F = 78.878$ , p value = 0.025, Durbin-Watson = 1.903

After the application of stepwise regression, the significant independent variables were only those presented in the above table, variables considered as having most influence on the level of corporate environmental reporting.

## Conclusions

Reporting of environmental information has matured over the past decades, but still remained a lack of adequate standardization and environmental disclosure remains voluntary in many countries. Our results suggest factors that explain the differences regarding corporate environmental disclosure: strength of auditing and accounting standards, governmental-mandated disclosure of environmental performance and pollutant release, environmental performance.

These results highlight that countries with high level of governmental-mandated disclosure of environmental performance and pollutant release and where the strength of auditing and accounting standards is high level present a high level of prevalence of corporate environmental reporting. So the determining factors of environmental reporting in the entities in a country remains the legal factor while ethical behaviour explains in a lesser extent environmental reporting. We believe that the introduction of mandatory environmental reporting within specific sectors and industries in a country would increase considerably the relevance, reliability and comparability of environmental reporting within the entities.

Environmental organizations within a country make pressure for environmental protection although most all this organizations don't have the authority to change environmental regulations. There are countries where is

one or two organization with big influences so the number of the organizations is not a very relevant factor regarding environmental disclosure. The relation between the number of companies that have implemented ISO 14001/EMAS and the environmental disclosure is not very well pointed by the analyses. I can conclude that although the implement of ISO 14001/EMAS determine an increase of corporate environmental disclosure level within a company there cannot be determine a clear relation between the number of companies that have implemented ISO 14001/EMAS and the environmental disclosure at the country level. The number of Eco-label awards within a country is not very suggestive for the amount of information disclose or for the countries profile regarding environmental disclosure. The factor is more suggestive for the quality of environmental disclosures and is more significant at company's level analyses.

Countries from Northern Europe and Western Europe with high level of environmental regulation and high level of auditing and accounting standards have also a high level of reporting environmental issues. From Europe Scandinavian countries present the highest reported environmental disclosure. This is the region with the highest level of environmental disclosure all over the world and it is represented by countries like Denmark, Finland and Sweden well known for the importance given to the environment. From Europe countries like Germany, United Kingdom and Scandinavian Countries (Denmark, Finland, Sweden) are developed country for which environmental protection is an important issue, countries with high GDP, long term oriented with high level audit and accounting standards, high level of governmental-mandated disclosure of environmental performance and pollutant release which determine also a high level of corporate environmental reporting. Some exceptions from the relations analyses have been observed especially from Italy, Spain and Greece. There were warnings sent to Italy and Greece for "failing to submit environmental studies on the current state of their water resources" (European Commission, 2007). Separately, the Commission said it was taking legal action against Italy over 11 cases of environmental law, most of them stemming from a failure to submit information on air pollution, management of waste, biotechnology and environmental impact assessments. "In spite of previous warnings, Italy is not complying fully with EU environmental laws or cooperating over our requests for information," Environment Commissioner Stavros Dimas said in a statement (European Commission, 2007). As we can see from the analyses most of the Southern Europe Countries and Eastern

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Europe countries (Romania, Bulgaria) are developing countries with low GDP per capital and with a low level of corporate environmental reporting. In these countries companies have difficulties regarding environmental disclosure:

- the first obstacle was found in the lack of regulations regarding the environmental reporting issues which might be used in order to reach the aimed value of environmental performance (like in the case of Romania); a low level regarding the strength of auditing and accounting standards;

- time dimension is also an important variable. These countries are only at the beginning its real integration in matters which regard the European Unions' structures and systems, this meaning that environmental legislation has changed and will continue to do so;

- a great number of companies only relate environmental investments to increased costs, without even seeing a glance of the possible returns and therefore are only interested to keep themselves at the thickest limit imposed through laws;

- a huge problem in approaching this topic is grounded within the environmental education which spreads both in the internal structures of one's entity and through the relationships between different entities; what we want to say here is that there should be a change in the entities' attitude towards environmental responsibility which ought to come out of common sense since all of us are interested in creating such an environmental management system which would lead to smaller quantities of wastes, decreased material consumption and fewer accidents. In a working paper in 2005 The World Bank consider that Bulgarian Croatian and Romania companies were far behind developed countries in terms of environmental practices.

The study presents importance for the understanding of environmental reporting and presenting differences regarding this issue between European countries and suggests that the legal factor, mandatory environmental disclosure is an efficient way that we can increase the quantity and the quality of environmental disclosure.

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**Table 1.** Description of variables analyzed

| Variable  | Codification | Source                                      | Values of variables   |
|---|--------------|---|---|
| The prevalence of corporate environmental disclosure                                    | CED          | The Global Competitiveness Report 2005-2006 | Variable can range between 1 and 7:<br>1 – absent<br>7 – widespread   |
| The governmental-mandated disclosure of environmental performance and pollutant release | GME          | The Global Competitiveness Report 2005-2006 | Variable can range between 1 and 7:<br>1 – voluntary<br>7 – mandatory   |
| The strength of auditing and accounting standards                                       | SAA          | The Global Competitiveness Report 2005-2006 | Variable can range between 1 and 7:<br>1 – absent<br>7 – widespread   |
| Eco-label awards obtained by companies within the country                               | EcoA         | European Commission Eurostat website        | Variable may take values greater than 0, depending on the number of entities in a country which obtained Eco-label awards   |
| Number of companies which had implemented ISO 14001 or EMAS                             | ISO-EMAS     | Federal Environmental Agency, Germany       | Variable may take values greater than 0, depending on the number of entities in a country which have implemented environmental management systems (ISO 14001, EMAS) |
| The level of development  | DEV          | The Global Competitiveness Report 2005-2006 | The level of development may take the following values: 1 underdeveloped country; 2 developing country; 3 developed country   |

|                                 |     |  |   |
|---------------------------------|-----|--|---|
| Environmental performance Index | EPI | Pilot 2006 Environmental Performance Index | Environmental performance index can range between 0 (minimum) and 100 (maximum) |
|---------------------------------|-----|--|---|

**Table 2.** Values of variables for each country in the European Union

| NR. CRT. | Country        | CED  | GME  | SAA  | DEV | ISO14001/EMAS | EcoA | EPI  |
|----------|----------------|------|------|------|-----|---------------|------|------|
| 1        | Austria        | 4,80 | 5,50 | 5,80 | 3   | 1001          | 12   | 85.2 |
| 2        | Belgium        | 4,90 | 4,90 | 5,80 | 3   | 864           | 4    | 75.9 |
| 3        | Bulgaria       | 2,70 | 3,20 | 4,40 | 2   | 97            | 0    | 72   |
| 4        | Cipru          | 3,40 | 4,00 | 5,40 | 3   | 47            | 0    | 78.4 |
| 5        | Czech Republic | 4,00 | 4,90 | 4,30 | 3   | 1342          | 2    | 86   |
| 6        | Denmark        | 5,90 | 6,20 | 5,90 | 3   | 1086          | 55   | 84.2 |
| 7        | Estonia        | 4,10 | 4,90 | 5,60 | 2   | 184           | 0    | 82   |
| 8        | Finland        | 5,70 | 5,80 | 6,10 | 3   | 1041          | 5    | 87   |
| 9        | France         | 5,20 | 5,30 | 6,10 | 3   | 3646          | 50   | 82.5 |
| 10       | Germany        | 5,90 | 6,10 | 6,10 | 3   | 7779          | 21   | 79.4 |
| 11       | Greece         | 3,40 | 3,70 | 4,80 | 3   | 354           | 16   | 80.2 |
| 12       | Hungary        | 4,70 | 4,60 | 4,90 | 2   | 1151          | 1    | 77.1 |
| 13       | Ireland        | 4,50 | 4,90 | 6,00 | 3   | 302           | 9    | 83.3 |
| 14       | Italy          | 3,60 | 4,20 | 3,70 | 3   | 10586         | 95   | 79.8 |
| 15       | Latvia         | 3,30 | 3,90 | 4,80 | 2   | 101           | 0    | 80   |
| 16       | Lithuania      | 4,30 | 4,40 | 4,90 | 2   | 267           | 0    | 82.2 |
| 17       | Luxembourg     | 4,60 | 4,10 | 5,70 | 3   | 54            | 0    | 80.1 |
| 18       | Malta          | 2,50 | 2,80 | 4,50 | 3   | 6             | 1    | 80   |
| 19       | Netherlands    | 5,50 | 5,40 | 6,00 | 3   | 1149          | 11   | 78.7 |
| 20       | Poland         | 3,80 | 3,90 | 4,30 | 2   | 603           | 3    | 76.2 |
| 21       | Portugal       | 3,80 | 4,30 | 5,10 | 3   | 623           | 6    | 82.9 |
| 22       | Romania        | 3,40 | 3,20 | 4,10 | 2   | 1454          | 0    | 56.9 |
| 23       | Slovakia       | 3,90 | 4,90 | 4,50 | 2   | 343           | 0    | 79.1 |
| 24       | Slovenia       | 5,00 | 5,00 | 5,00 | 3   | 352           | 4    | 77.5 |

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|    |  |      |      |      |   |       |    |      |
|----|--|------|------|------|---|-------|----|------|
| 25 | Spain  | 4,10 | 4,40 | 4,90 | 3 | 12048 | 21 | 79.2 |
| 26 | Sweden   | 5,80 | 5,80 | 6,20 | 3 | 4950  | 17 | 87.8 |
| 27 | United Kingdom of Great Britain and Northern Ireland | 5,60 | 5,40 | 6,60 | 3 | 5764  | 12 | 85.6 |

Source: dates are selected from Global Competitiveness Report 2005-2006, Pilot 2006 Environmental Performance Index, Eurostat, Federal Environmental Agency