THE INFLUENCE OF CORPORATE GOVERNANCE FACTORS ON ESG RATING OF INDUSTRIAL AND IT COMPANIES

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The article examines the impact of corporate governance factors on the environmental, social, and governance rating in companies from industrial and IT sectors. The aim of this study is to identify and measure the impact of corporate governance factors on ESG rating in industrial and IT sectors. The research also includes a country-specific analysis: for European, Asian and American companies. The dependent variable is ESG rating — an indicator of the company's compliance with environmental, social and governance standards. The paper considers observations of 80 companies since 2005 to 2020. The results of this study showed that the most significant practices in European companies are the presence of a policy of independence of the board of directors and an increase in the percentage of non-executive members. For Asian companies, corporate governance factors such as the presence of a policy of independence of the board of directors, an increase in the percentage of non-executive directors effect positively. For American companies, the following practices positively influence the ESG rating — the existence of a policy of independence of the board of directors and the corporate social responsibility committee and an increase in the percentage of women on the board of directors. In terms of sectors, the results showed that information technology companies are positively affected by an increase in the percentage of non-executive members, the presence of a corporate social responsibility committee, and an increase in average age. Also, if the chairperson is a woman the chances of getting a higher ESG rating increase. In industrial sector companies, the presence of a corporate social responsibility committee and a policy of independence of the board of directors, as well as the fact that the chairman was a CEO, are positively affected. These results can be used by companies to develop a plan to improve corporate performance.

Keywords: ESG rating, corporate factors, board efficiency, gender diversity, age diversification.

JEL: G24, G30, G32, L60, O16, Q01, Q56.

INTRODUCTION

Sustainable development is one of the key global trends in the development of modern companies. The concept of sustainable development requires companies to develop and implement management methods and tools that allow them to achieve ecological, social and governance development goals, for which the abbreviation ESG "ecological, social and governance" is accepted.

According to a joint study of Deutsche asset management and the University of Hamburg of the impact of ESG factors on the financial performance of companies [Friede, Busch, Bassen, 2015], the share of corporate performance (G-factors) in the financial stability of companies reaches 62.5 %. G-factor reflects a long-term and unique company strategy, audit and internal control, the board of directors and employees, management remuneration and shareholder rights. Gender diversity — is one the most discussed and controversial parameter in this way, especially in such industries and industrial and IT. Thus, the analysis based on real data of corporate governance and companies ESG rating will highlight the key G-factors that organizations should pay more attention to and develop them to increase the profitability of their own business and improve the sustainability rating.

The purpose of this study is to identify and measure the impact of corporate governance factors on ESG rating in industrial and IT sector and in the context of the company belonging to one of the considered continents.

The research question of this article is which corporate governance practices have the greatest impact on a company's chances of increasing a company's ESG rating.

The practical relevance of this study lies in the fact that the results of the study can be used by companies as recommendations to achieve goals in the field of ESG risk management and improve their sustainability rating.

The article consists of two blocks: a theoretical part, which includes a review of existing research on the relationship between ESG rating and corporate governance, as well as a practical part, where the strength and direction of this relationship is assessed using ordered logistic regression.

1. LITERATURE REVIEW

1.1. The relevance of ESG rating

Interest in responsible investing and doing business began to develop in the 19th century, after which the terms socially responsible investment (SRI) and corporate social responsibility (CSR) began to emerge. The closest concept to ecological, social and governance (ESG) is the concept of corporate social responsibility, which implies that companies consider their impact on the environment and society.

The term ESG, which has gained popularity in recent years, was first mentioned in the 2004 report "The Global Compact" [Eccles, Stroehle, 2018]. For further reasoning, it is necessary to clarify what exactly is meant by ESG factors and ESG rating. ESG factors are those, connected to the environment (ecological and climate), society and corporate governance, while ESG rating is an evaluation of a company's responsibility related to ecological, social and governance issues.

Now there are more than a hundred organizations that provide ESG ratings, but several of the most influential and large agencies stand out among them: Vigeo-EIRIS, MSCI, ISS-Oekom, Sustainalytics, CDP and others. However, because ESG factors are not strictly regulated and there are no standardized reporting principles for their disclosure, ratings vary widely and consider various factors in different planes. The Refinitiv ESG rating used in this study has several advantages. The main parameter due to which this rating was chosen is the presence of historical data for a sufficiently long period. In addition,

the estimate is based on 500 or more different factors, compiled for 9000 companies around the world [Refinitiv, 2021].

1.2. ESG and corporate governance

To represent the "G" — factors, it is worth dwelling in more detail on the methodology for compiling ESG ratings by the main agencies, namely, which factors are the main ones in a particular approach.

Companies tend to disclose their own ESG responsibilities unevenly. For example, in the article [Tamimi, Sebastianelli, 2017], the authors conclude that S&P 500 organizations report in more detail and in accordance with reality specifically on corporate factors, rather than on environmental indicators that demonstrate feedback. This fact allows us to study the indicators of corporate governance and get more reliable results, which are more likely to correspond to reality.

One of the most important indicators of good organization management is the structure of the board of directors. According to agency theory, independent directors should occupy most seats on the board of directors as they can control the behavior of the board. While, in accord with the stakeholders theory, independent board of directors is a key to a better ESG performance [Naciti, 2019]. A high percent of non-executive directors has a positive impact on the company's image, as it fosters the opinion that the firm is following its own social responsibility. In addition, it strives to strike a balance between the responsible operation of the company and the desire to improve its financial position. Also, in the context of the fact that the post of CEO and chairman is occupied by one person, there is a tendency to less disclosure of information about the ESG responsibility of the organization [Arayssi, Jizi, Tabaja, 2020], since the independence of these two structures is not respected, conforming to agency theory. The appointment of an independent, non-executive director as the chairman increases the quality and completeness of ESG reporting [Cucari, Falco, Orlando, 2017; Chouaibi, Chouaibi, Zouari, 2021]. In addition to the positive impact of diverse board composition on social responsibility, there is also a positive effect on the environmental performance of companies [Haque, Ntim, 2018]. Also, an effective composition of directors entails a higher degree of disclosure of information on corporate social responsibility [Lu, Wang, 2021].

Another indicator of high corporate social responsibility is the involvement of women in the management of the company as it is positively correlated with ESG performance according to Stakeholders Theory [Naciti, 2019]. Several studies examining the contribution of gender diversity to the board of directors has confirmed that the presence of women in the composition increases the level of ESG disclosure of the company's activities [Velte, 2016; Tamimi, Sebastianelli, 2017]. However, there is another point of view: in the study [Manita, Bruna, Houanti, 2018], no connection was found between the gender component and the depth of information disclosure. In addition, greater gender diversity in the top management of banking industry organizations leads to higher ESG performance [Shakil, Tasnia, Mostafiz, 2020].

The indicator of age diversity in the board of directors remains less researched. In some cases, it is seen as part of the characteristics of board members, along with gender and cultural diversity [Walls, Berrone, Phan, 2012], but less often its individual impact is examined. However, there is a study that found a link between the age component of the board of directors and the sustainability of doing business: the presence of more young generations on the board of directors is most often associated with greater flexibility and a more likely movement towards the development of sustainable business [Ferrero-Ferrero, Fernández-Izquierdo, Mucoz-Torres, 2015].

2. METHODOLOGY AND MODEL DEVELOPMENT

2.1. Research hypotheses

Hypothesis H1. An effective composition of directors has a positive effect on the company's position in the ESG rating.

An effective composition of directors means that it is independent, in addition, the positions of the chairman of the board of directors and the CEO are different people, and the company also has an ESG committee. An effective composition of directors has a positive effect on disclosure of corporate social responsibility and leads to improved environmental performance [Lu, Wang, 2021]. In this regard, my task is to identify the degree of the above factors influence on the company's position in the ESG rating.

Hypothesis H2. The number of women on the board of directors increases the company's position in the ESG rating.

Several studies show that companies with women in management have better ESG rating than firms with no gender difference among senior executives [Velte, 2016]. However, it is necessary to check whether this fact increases the company's place in the rating, or whether the influence is small and only slightly increases the ESG rating itself.

Hypothesis H3. Diversification of age groups in the composition of directors leads to higher positions in the ESG rating.

There is little research on board generational diversity. However, using the case study of 146 companies, it was found that it has a positive effect on the disclosure of information about the corporate social responsibility of firms. In addition, the more age groups are included in the management, the better the interaction of employees with each other, as well as the better the relationship with stakeholders [Ferrero-Ferrero, Fernández-Izquierdo, Mucoz-Torres, 2015]. This research is dedicated to find out if the diversity of generations in and the average age the composition of directors that positively influences a company's place in the ESG rating.

2.2. Novelty of the study

This study contributes to the existing literature in several ways. First, as noted earlier, in previous studies, indicators of the age diversification of the board of directors (hypothesis *H3*) were practically not considered. Secondly, there is almost no research in which samples are divided by continent and sector, considering the influence of the sphere where the company operates and the country of origin. Thus, this study will allow us to assess how much the results differ between the general specification, across countries and across industries (all hypotheses).

2.3. Methodology and model

The theoretical basis was the work of some previous studies [Ferrero-Ferrero, Fernández-Izquierdo, Mucoz-Torres, 2015; Velte, 2016; Lu, Wang, 2021]. The method of studying the influence of gender diversity on ESG rating is the model of ordered choice — ordered logistic regression, mentioned for the first time in the work of McCullagh [McCullagh, 1980].

In this case, we consider regression with one categorical dependent variable Y, which is the ESG rating of a company, which has several explanatory indicators X, which have a functional relationship:

$$Y = f(x_1 \ldots x_n).$$

This regression is applied if a higher value of the dependent variable means a higher-ranking position, and therefore the literal values of the ESG rating were converted into numerical values according to the scale presented in Table 1.

Ordered logistic regression is defined according to a logistic function [Grilli, Rampichini, 2014] of the form:

Scale for converting the alphabetic value ESG to numerical

Letter grade ESG	A+	A	A−	B+	B	B−	C+	C	C−	D+	D	D−
The numerical value of the rating	12	11	10	9	8	7	6	5	4	3	2	1

Note: ESG rating measures a company's ESG performance based on reported data in the public domain; companies are ranked from the best (A+) to the worst (D-) ESG rating.

$$log\left(\frac{Pr\left(Y_i \leq m \mid x_i\right)}{Pr\left(Y_i > m \mid x_i\right)}\right) = \gamma_m - \beta' x_i \left(1 \leq m < 12\right), \quad (1)$$

where Y — dependent variable, m — he numerical value of the ESG rating, γ_m the boundary that increases each time, $\beta' x_i$ — vector of coefficient estimates, equal $\beta' = \beta_0 + \beta_1 + ... + \beta_m$.

2.4. Data

For the subsequent construction of the model, companies were selected in two industries according to the Bloomberg industry classification standard — industry and technology.

Thus, 80 companies are analyzed: 40 technology firms and 40 industrial firms, for which there is as much data as possible on the corporate indicators under consideration. Time horizon for data sampling — 16 years since 2005 to 2020. However, in this study the impact of different sustainability initiatives, like the Paris agreement, are not concerned. Observation period has the most available data on companies' ESG performance, so that the sample is sufficient to carry out an analysis. Data collection was carried out using Bloomberg and Thomson Reuters Eikon terminals. The dependent variable in the regression model, which is presented below, is the ESG rating, which ranges from the highest "A+" to the lowest "D−".

In total, companies from 12 countries are considered. The Figure 1 demonstrates that in the largest number of companies
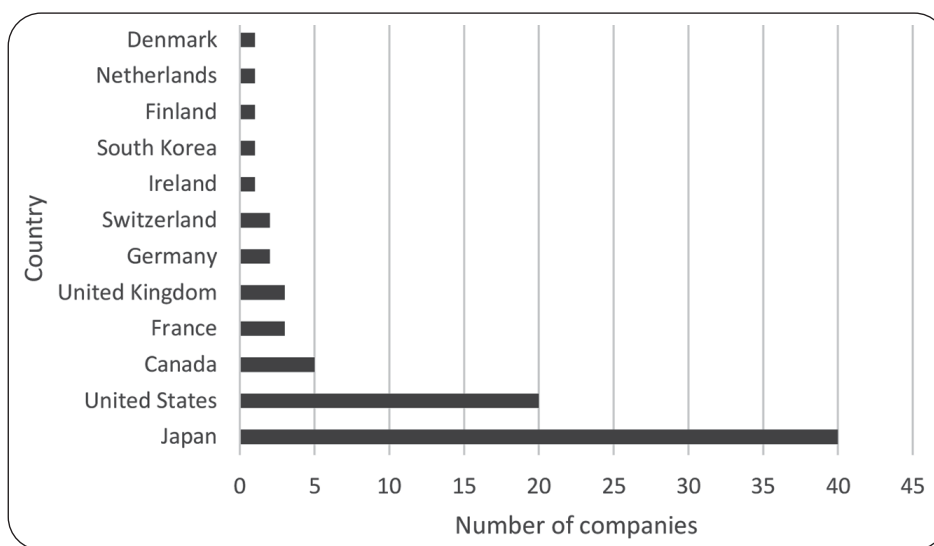

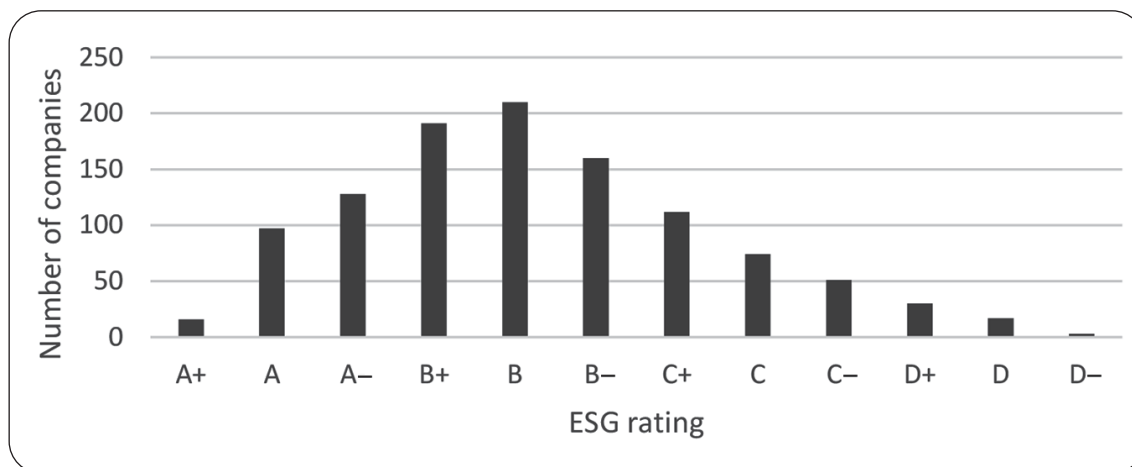*Fig. 1.* Distribution of companies by country of origin, 2005−2020

Fig. 2. ESG rating distribution, 2005–2020

the head office is located in Japan, namely in 40 organizations under consideration. The second most popular is the United States of America, with 20 companies. The remaining countries have 20 organizations. It should be noted that in this study only developed countries are considered, in which the corporate governance system is the most elaborated.

The distribution of ESG scores for the companies under consideration is presented in the Figure 2.

Based on the Figure 2, the largest number of estimates in the sample is B. At the same time, before it, the number of observations for each estimate increases, after — it decreases. Visually, this distribution is close to normal.

The control variable is the individual score for the component of corporate governance. Since this indicator is a component of the overall ESG rating, its influence on it has been established and, if the model is correctly specified, it should be positive.

The remaining indicators are considered explanatory variables in this study. A detailed description of each factor is presented in the Table 2.

According to the indicators, the description of which is presented in the Table above, the specifications of the model will be formed, which will allow assessing the relationship between the ESG rating and the components of corporate governance.

2.5. Model

An ordered selection model is used to assess the impact of corporate factors on ESG rating.

The first specification of the model will be the regression for the general sample:

$$
\begin{aligned}
ESG\,rating = {} & \beta_0 + \beta_1\,Policy\,independence + \\
& + \beta_2\,Non\,executive\,members + \\
& + \beta_3\,Independent\,members + \\
& + \beta_4\,CEO\,Chairman\,separation + \\
& + \beta_5\,CEO\,is\,a\,board\,member + \\
& + \beta_6\,Chairman\,is\,ex\,CEO + \beta_7\,CSR\,committee + \\
& + \beta_8\,Percent\,of\,women\,on\,board + \\
& + \beta_9\,Female\,CEO + \beta_{10}\,Female\,Chairperson + \\
& + \beta_{11}\,Age\,range + \beta_{12}\,Average\,age + \\
& + \beta_{13}\,Governance\,score + \varepsilon\,, \qquad (2)
\end{aligned}
$$

where the independent variable is: ESG rating — assessment of companies according to environmental, social and governance factors; explanatory variables are: policy

Explanatory variables in model specifications

Variable	Description	Unit	Expected influence on ESG rating	Mean	Standard deviation
Indicators for testing hypothesis H1					
Policy independence	Equals 0 if there is no policy of independence, 1 otherwise	0/1	+	N/A	N/A
Non-executive members, %	Percentage of non-executive directors on the board	%	+	58.7	31.3
Independent members	Percentage of independent directors on the board	%	+	50	32.8
CEO Chairman separation	Equals 0 if the CEO is also the chairman, 1 otherwise	0/1	+	N/A	N/A
CEO is a board member	Equals 0 if the CEO is not on the board of directors, 1 otherwise	0/1	–	N/A	N/A
Chairman is ex-CEO	Equals 0 if the chairman previously was not the CEO of the company, 1 otherwise	0/1	–	N/A	N/A
CSR committee	Equals 0 in the absence of a corporate social responsibility committee, 1 otherwise	0/1	+	N/A	N/A
Indicators for testing hypothesis H2					
Percent of women on board	Percentage of women on board	%	+	11.5	11.9
Female CEO	Equals 0 if the CEO of the company is a man, 1 — a woman	0/1	+	N/A	N/A
Female Chairperson	Equals 0 if the chairperson is a man, 1 — a woman	0/1	+	N/A	N/A
Indicators for testing hypothesis H3					
Age range	Age range of board members	year	–	21.3	7.6
Average age	Average age of board members	year	–	61.5	3.3
Additional indicators					
Governance score	Control variable that measures the company's systems and processes to ensure that board members and managers act in the best interests of their long-term shareholders	A numerical value from 1 to 12 assigned to grades*	+	N/A	N/A

Notes: * — according to Table 1; "+" represents expected positive coefficient, "–" represents expected negative coefficient; "N/A" means that there is no mean and standard deviation for categorical variables.

independence, non-executive members, independent members, CEO chairman separation, CEO is a board member, chairman is ex-CEO, CSR committee, percent of women on board, female CEO, female chairperson, age range, average age and governance score — detailed description of all explanatory variables is given in the Table 2.

The specification presented in the formula above will be produced on a total sample and separately for Asian, European, and American organizations and for IT and industrial subsamples. However, there is no division of indicators by industry and region since the aim of the research is to study the impact of the same indicators on ESG performance of companies operating in different countries and industries.

Further, to test hypotheses, narrower specifications will be considered, but all will include a control variable — the assessment of the corporate governance component. In addition, these specifications will be analyzed by subsamples as mentioned before.

Hypothesis H1. This hypothesis examines the relationship between good governance and ESG rating:

$$
\begin{aligned}
ESG\,Rating = {}& \beta_0 + \beta_1\,PolicyIndependence + \\
& + \beta_2\,NonExecutiveMembers + \\
& + \beta_4\,CEOChairmanSeparation + \\
& + \beta_5\,CEOBoardMember + \\
& + \beta_6\,ChairmanexCEO + \\
& + \beta_7\,CSRCommittee + \\
& + \beta_8\,GovernanceScore + \varepsilon\,.
\end{aligned} \tag{3}
$$

Hypothesis H2. The second hypothesis examines the contribution of women in top management to the company's position in the ESG rating:

$$
\begin{aligned}
ESG\,Rating = {}& \alpha + \\
& + \beta_1\,PercentWomenonBoard + \\
& + \beta_2\,FemaleCEO + \beta_3\,FemaleChairperson + \\
& + \beta_4\,GovernanceScore + \varepsilon.
\end{aligned} \tag{4}
$$

Hypothesis H3. The last hypothesis examines the influence of the age of the board members on the company's ESG rating:

$$
\begin{aligned}
ESG\,Rating = {}& \beta_0 + \\
& + \beta_1\,AgeRange + \\
& + \beta_2\,AverageAge + \\
& + \beta_3\,GovernanceScore + \varepsilon\,.
\end{aligned} \tag{5}
$$

After formulating the specifications of the model, it is necessary to prepare the data.

2.6. Data preparation

Before testing hypotheses by building a regression model, it is necessary to check the correlation between the explanatory variables. For a qualitative analysis of multiple regression, there should not be a strong correlation between the factors under consideration, namely, the correlation coefficients should not be equal in modulus 0.8–1. If such a strong dependence is observed, the indicators will be excluded from the model specification, since they are most likely duplicates, and the problem of collinearity arises.

To calculate the statistical relationship between the explanatory variables, the Pearson correlation coefficient is used (see Appendix 1). The only pair of indicators that have a significant correlation is the percentage of non-executive directors and the percentage of independent directors. The correlation coefficient in this pair is almost 0.9, which means that most likely the factors are duplicating or very similar.

According to the results of the correlation analysis, the indicator of the percentage of independent directors was removed from the analysis. The rest of the factors have a low or medium strength of connection, which is accepTable in the construction of regression.

3. EMPIRICAL RESULTS

3.1. Basic model without region specification

The first regression is based on all the considered indicators. Descriptive statistics of explanatory variables are presented in Appendix 2.

In total, 1089 observations are considered, however, there are gaps for several indicators — such observations are removed from the regression construction. However, the sample size is sufficient to analyze the impact of corporate factors.

Below is the result of evaluating this regression without considering the influence of the country of origin of the company (see Formula 6 and Appendix 3):

$$
\begin{aligned}
ESG\,Rating = {}& 0,403\,PolicyIndependence + \\
& + 0,006\,NonExecutiveMembers - \\
& - 0,527\,CEOChairmanSeparation - \\
& - 0,375\,CEOBoardMember + \\
& + 0,656\,ChairmanexCEO + \\
& + 1,747\,CSRCommittee + \\
& + 0,013\,PercentWomenonBoard - \\
& - 0,011\,FemaleCEO + 0,528\,FemaleChairperson + \\
& + 0,007\,AgeRange + 0,008\,AverageAge + \\
& + 0,748\,GovernanceScore + \varepsilon. \qquad (6)
\end{aligned}
$$

There are indicators in the regression, whose influence is not significant — these are both age indicators and several dummy variables: the separation of the CEO and the chairman, also the gender of the CEO and the chairperson.

However, since the ordered-choice model considers log odds, the coefficients cannot be interpreted as in the OLS model (ORD21). For interpretation the odds ratio must be considered (see Appendix 4).

This result can be interpreted as follows: when the value of "Policy independence" is increased by one unit, that is, when the indicator of independence policy changes in

one observation from 0 — its absence, to 1 — its presence, the chances of getting a higher ESG score than it is now, increase by 1.497 times, provided all other variables unchanged.

3.2. Models with region specification

Model for European companies. European countries include observations from Denmark, the Netherlands, Finland, Ireland, Great Britain, Switzerland, Germany and France. There are 194 observations in this subsample. In addition, in the considered companies from Europe there are no observations where the CEO is a woman. Thus, this indicator is excluded from the regression specification.

The following are the results of evaluating the regression with odds ratios for interpretation (see Formula 7 and Appendix 5):

$$
\begin{aligned}
ESG\,Rating_{Europe} = {}& 0,802\,PolicyIndependence + \\
& + 0,052\,NonExecutiveMembers - \\
& - 0,262\,CEOChairmanSeparation + \\
& + 0,073\,CEOBoardMember + \\
& + 0,045\,ChairmanexCEO + 1,915\,CSRCommittee - \\
& - 0,002\,PercentWomenonBoard - \\
& - 0,745\,FemaleChairperson + \\
& + 0,007\,AgeRange + 0,18\,AverageAge + \\
& + 0,65\,GovernanceScore + \varepsilon. \qquad (7)
\end{aligned}
$$

Model for Asian companies. The next continent under consideration is Asia, which includes observations from the countries of Japan and South Korea.

The total number of observations from Asian countries is 553. It is also worth noting that in Asia, gender diversity in the upper layers of government is not widespread, which is why there is a low percentage of women on the board of directors. Also, in the sample under consideration, there are no observations in which women occupy the position of CEO or chairman, so these regressors will be excluded from the specification.

The results of constructing the regression are as follows (see Formula 8 and Appendix 6):

$$ESG\,Rating_{Asia} =$$
$$= 0,824\,PolicyIndependence +$$
$$+ 0,021\,NonExecutiveMembers -$$
$$- 0,818\,CEOChairmanSeparation +$$
$$+ 0,102\,CEOBoardMember +$$
$$+ 1,03\,ChairmanexCEO +$$
$$+ 1,809\,CSRCommittee -$$
$$- 0,023\,PercentWomenonBoard -$$
$$- 0,03\,AgeRange + 0,055\,AverageAge +$$
$$+ 0,728\,GovernanceScore + \varepsilon. \qquad (8)$$

Model for American companies. The last continent to be considered is America — this includes the United States and Canada. There are 342 observations in this subsample.

Thus, the results of constructing regression are as follows (see Formula 9 and Appendix 7):

$$ESG\,Rating_{America} = 3,997\,PolicyIndependence -$$
$$- 0,023\,NonExecutiveMembers -$$
$$- 0,539\,CEOChairmanSeparation -$$
$$- 1,238\,CEOBoardMember +$$
$$+ 0,789\,ChairmanexCEO +$$
$$+ 1,218\,CSRCommittee +$$
$$+ 0,045\,PercentWomenonBoard +$$
$$+ 0,147\,FemaleCEO +$$
$$+ 0,425\,FemaleChairperson +$$
$$+ 0,023\,AgeRange + 0,031\,AverageAge +$$
$$+ 0,871\,GovernanceScore + \varepsilon . \qquad (9)$$

Results of models with region affiliation. Based on the obtained coefficients, several conclusions can be drawn.

The presence of a policy of independence of the board of directors and the CSR committee has a positive significant impact, regardless of the place of origin of the company.

Only in US companies the percentage of independent directors have no significant impact, while in European and Asian companies a larger percentage of non-executive members leads to an increase in the chances of increasing the ESG score.

Only in Asian companies does the separation of the position of CEO and Chairman have a significant coefficient, but the impact is negative: if these positions are occupied by one person, then the probability of getting a higher rating is higher.

In Europe, the fact that the chairman is ex-CEO does not have a significant impact on the ESG score, in contrast to Asia and America, where there is a positive relationship, suggesting that if a chairman is ex-CEO, then the ESG score will be higher.

Among indicators of gender diversity, only the percentage of women on the board of directors of US companies showed a positive effect on the chances of getting a higher rating.

In Europe, board age diversification has a positive impact: the higher the age range and average age of board members, the higher the company's ESG score. At the same time, in Asian companies, only the age range indicator has a significant coefficient, but its influence is negative. In America, age diversification does not matter.

Having assessed the impact of the country affiliation of companies, it is worth looking at how the sector to which the company belongs affects the ESG rating.

3.3. Models with sector specification

Model for IT companies. In addition, the specifics of the sectors under consideration will be analyzed.

There are 419 observations in IT subsample. The regression results are below (see Formula 10 and Appendix 8):

$$ESG\,Rating_{IT} = 0,097\,PolicyIndependence +$$
$$+ 0,018\,NonExecutiveMembers -$$
$$- 0,705\,CEOChairmanSeparation -$$
$$- 0,569\,CEOBoardMember +$$

$$+0,754\,Chairman\,exCEO+1,885\,CSRCommittee+$$
$$+0,014\,PercentWomenonBoard+$$
$$+0,406\,FemaleCEO+1,111\,FemaleChairperson-$$
$$-0,004\,AgeRange+0,052\,AverageAge+$$
$$+0,867\,GovernanceScore+\varepsilon. \qquad (10)$$

Model for industrial companies. The regression based on Industrial companies includes 420 observations. The results are shown below (see Formula 11 and Appendix 9):

$$ESG\ \ Rating_{Industrial}=0,635\,PolicyIndependence-$$
$$-0,004\,NonExecutiveMembers-$$
$$-0,135\,CEOChairmanSeparation-$$
$$-0,888\,CEOBoardMember+$$
$$+0,758\,Chairman\,exCEO+1,569\,CSRCommittee+$$
$$+0,015\,PercentWomenonBoard-$$
$$-1,672\,FemaleCEO+0,957\,FemaleChairperson+$$
$$+0,957\,FemaleChairperson+$$
$$+0,015\,AgeRange+0,006\,AverageAge+$$
$$0,698\,GovernanceScore+\varepsilon. \qquad (11)$$

Results of models with sector affiliation. Based on the assessment of regression models and the resulting beta values, several conclusions can be drawn about the impact of the sector on the relationship between ESG rating and corporate governance.

In both IT and industrial companies, there is a significant positive impact of having a CSR committee, as well as the fact that the chairman previously worked as CEO.

In IT companies, the percentage of non-executive members has a positive significant impact, while the separation of the post of CEO and chairman influence negatively.

In the industrial sector, the existence of a board independence policy is positively associated with the chances of an ESG rating upgrade. The presence of a CEO on the board of directors has a negative impact.

If the position of chairperson is occupied by a woman, then in IT companies the chanc-

es of moving to a higher rating increase. However, other indicators of gender diversity are not significant in both the sample of IT and industrial companies.

Among indicators of age diversification, a significant coefficient was obtained only for the explanatory variable "Average age" in IT companies, but its significance level is 10 %, which is not a sufficiently reliable result.

Thus, the influence of regional and sectoral affiliation on the relationship between the rating and some corporate indicators was obtained.

3.4. Overall results

The overall results are presented in Table 3.

Hypothesis H1. An effective composition of directors has a positive effect on the company's position in the ESG rating.

We can conclude that the hypothesis that the effective composition of directors has a positive effect on the company's position in the ESG rating is partially confirmed as not all indicators of effective composition give the expected sign.

Indeed, the presence of an independence policy and a corporate social responsibility committee has a positive and significant effect in almost all considered regressions, except based on IT companies, where policy independence is insignificant. A positive relationship between the presence of a CSR committee and ESG performance was also observed by other authors [Gallego-Álvarez, Pucheta-Martínez, 2019; Shahbaz et al., 2020].

The indicator of non-executive directors, which in this case reflects the degree of independence of the directors' composition, also, as expected, has a positive effect on the company's position in the ESG rating. This result coincides with that obtained in the works of most authors [Gallego-Álvarez, Pucheta-Martínez, 2019; Shahbaz et al., 2020]. However, Naciti's work found a negative relationship between board independence and sustainability performance

Expected influence and actual results

Variable	Expected sign	Basic model	IT	Industrial	Europe	Asia	America
Hypothesis H1							
Policy independence	+	+**	+	+**	+**	+ ***	+***
Non-executive members, %	+	+*	+***	–	+***	+ ***	–
CEO Chairman separation	+	–***	–**	–	–	–***	–
CEO is a board member	–	–	–	–***	+	–	–
Chairman is ex-CEO	–	+***	+**	+***	+	+***	+**
CSR committee	+	+***	+***	+***	+***	+***	+***
Hypothesis H2							
Percent of women on board	+	+*	+	+	–	–	+***
Female CEO	+	–	+	–	N/A	N/A	+
Female Chairperson	+	+	+**	+	–	N/A	+
Hypothesis H3							
Age range	–	+	–	+	+***	–**	+
Average age	–	+	+*	+	+***	+	+
Control							
Governance score	+	+***	+***	+***	+***	+***	+***

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; standard errors in parentheses; "+" represents expected/obtained positive coefficient; "–" represents expected/obtained negative coefficient; "N/A" means that the variable was excluded from the model.

[Naciti, 2019]. This result is also consistent with corporate governance models.

The presence of the CEO in the directors' composition is insignificant and could not be interpreted in almost all samples excluding industrial companies where this indicator negatively affects the ESG rating. This result is consistent with expected impact.

The assumption is rejected about the influence of such variables as: separation of the position of CEO and chairman, in which a negative sign prevails among significant assessments, and a dummy variable characterizing whether the chairman was previously the CEO, which showed significant positive influence in all the models under consideration although it was as-

sumed that a negative value would be observed.

So, the increase in the number of independent directors, the presence of a corporate social responsibility committee, the existence of a policy of independence of the board of directors, as well as the absence of a CEO in the composition, all lead to an increase in the chances of receiving a higher ESG rating. However, the separation of the positions of CEO and chairman in most cases, including in the general sample, has a negative effect on the company's position in the rating.

Nevertheless, the obtained influence of the last-mentioned indicator confirms the conclusions of some authors, who also re-

vealed that in some situations, when the chairman is at the same time the CEO of the company, the interest of this official in more effective activities in the field of ecology and social agenda increases, which consequently increases the ESG rating [Jizi et al., 2014; Gallego-Álvarez, Pucheta-Martínez, 2019; Arayssi, Jizi, Tabaja, 2020].

Hypothesis H2. The number of women on the board of directors increases the company's position in the ESG rating.

The hypothesis of gender diversification is confirmed, since in all samples under consideration where this indicator is significant, an increase in the percentage of women has a positive value of the coefficient and leads to an increase in the chances of transition to a higher ESG rating, which coincides with the agency theory. In the literature the issue of gender diversity of the board of directors is a controversial topic. There are studies that confirm the dependence obtained in the article and find a positive relationship between gender diversity and ESG scores [Naciti, 2019; Shahbaz et al., 2020]. However, for example, in the Gallego-Alvarez study [Gallego-Álvarez, Pucheta-Martínez, 2019], which examined developing countries, the results showed an insignificant relationship, since the presence of women is limited and minimal in the companies under consideration.

Even though the obtained sign for the chairperson's gender is significant only for IT companies, the expected positive sign was confirmed. However, the gender indicator of the CEO was insignificant in the results obtained, and therefore its influence cannot be analyzed.

Hypothesis H3. Diversification of age groups in the composition of directors leads to higher positions in the ESG rating.

The hypothesis about age diversification and younger average age of the board of directors is rejected. The average age indicator for all samples showed a positive impact, but a negative one was predicted. Thus, a higher average age leads to an increase in the company's position in the ESG rating.

The age range had one positive sign and one negative sign among the significant indicators, however, the power of influence in both European and Asian observations is rather low, close to zero. This relationship is most likely since few companies have sufficiently young employees, and the older generation on the board of directors usually has a lot of experience, which leads to better management and higher ESG performance.

4. CONCLUSION

As a result of this study, all the objectives were achieved: a literature review was carried out, in which already existing research on the influence of corporate factors on the assessment of ESG was considered. Based on the analyzed works of other authors, hypotheses were put forward about the influence of the effective composition of directors, gender diversity and age diversification on the company's position in the ESG rating. Before building the regression, the data were prepared and the theoretical basis for building the model was considered. Further, a regression was built, in which the influence of all indicators on the ESG rating was investigated, and the change in the coefficients depending on the country of origin of the company was considered: observations were analyzed for three continents — Europe, Asia and America. The same steps were taken to obtain narrower results for the hypotheses put forward.

At the same time, some features of the country's influence were highlighted: in companies from Asian countries, there were no observations in which the position of CEO and chairperson was held by a woman, and, on average, the percentage of women on the board of directors for these countries was lower than in Europe and America.

The prospects of the study are to expand the sample: adding observations from new sectors and countries, as well as considering a larger number of corporate factors. In ad-

dition, it may be worth considering the relationship between ESG scores and financial performance dynamics.

4.1. Practical implications

The results obtained allow us to highlight several recommendations for companies:
- for European companies, the presence of a policy of independence of the board of directors and the presence of a CSR committee have the greatest impact;
- companies originating in Japan and South Korea should establish a CSR committee, appoint a former CEO as chairman, and develop a policy of director independence. These findings also apply to companies in the US and Canada. However, Asian companies should not share the position of chairman and CEO between two people;

- IT companies should create a CSR committee, appoint a woman to the position of chairperson, and do not appoint different people to the position of chairperson and CEO;
- for companies that operate in the industrial sector, important corporate governance practices that could increase the chances of getting a higher ESG rating are the presence of a CSR committee and a policy of independence of the board of directors, the practice of appointing a former CEO to the position of chairman and not having a CEO on the board of directors.

It should be noted that the results of this study do not identify high ESG rating solely with the presence of the above-mentioned corporate governance practices in the company. Considering these recommendations in the work will only increase the chances of increasing the ESG rating.

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Влияние факторов корпоративного управления на ESG-рейтинг промышленных и ИТ-компаний

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В статье рассматривается влияние факторов корпоративного управления на экологический, социальный и управленческий рейтинг в компаниях из сектора промышленности и информационных технологий. Целью исследования является измерение влияния факторов корпоративного управления на рейтинг ESG в промышленном и ИТ-секторах европейских, азиатских и американских компаний. Зависимой переменной выступает ESG-рейтинг — показатель соблюдения компанией экологических, социальных и управленческих стандартов. В работе рассмотрена деятельность 80 компаний в период с 2005 по 2020 г. Результаты исследования показали, что наиболее значимыми практиками в европейских компаниях являются наличие политики независимости совета директоров и увеличение доли неисполнительных членов. Для азиатских компаний положительными стали такие факторы корпоративного управления, как наличие политики независимости совета директоров и увеличение доли независимых дирек-

торов. Для американских компаний на рейтинг ESG позитивно влияют следующие практики: наличие политики независимости совета директоров, комитета по корпоративной социальной ответственности и увеличение доли женщин в совете директоров. В отношении секторов обнаружено, что на ИТ-компаниях положительно отражается увеличение доли неисполнительных членов, наличие комитета по корпоративной социальной ответственности и увеличение среднего возраста. Кроме того, если председателем правления компании является женщина, то шансы на получение более высокого рейтинга ESG увеличиваются. Для промышленных компаний актуальны наличие комитета по корпоративной социальной ответственности и проведение политики независимости совета директоров, а также то обстоятельство, что председатель правления является генеральным директором.

Appendix

Appendix 1. Correlation matrix

Variable	Non-executive members, %	Independent members, %	Percent women on board	Age range	Average age
Non-executive members, %	1				
Independent members, %	0.8971	1			
Percent of women on board	0.6813	0.6607	1		
Age range	0.1203	0.0316	0.1796	1	
Average age	−0.1059	−0.0463	−0.1205	−0.0632	1

Appendix 2. Basic model descriptive statistics

Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum
Policy independence	1089	0.529	0.499	0	1
Non-executive members, %	1063	58.696	31.261	0	100
CEO Chairman separation	1089	0.53	0.499	0	1
CEO is a board member	895	0.894	0.308	0	1
Chairman is ex-CEO	1089	0.397	0.489	0	1
CSR committee	1089	0.743	0.437	0	1
Percent of women on board	1089	11.501	11.929	0	53.85
Female CEO	1083	0.046	0.21	0	1
Female Chairperson	1073	0.04	0.196	0	1
Age range	1064	21.249	7.615	4	49
Average age	1075	61.52	3.335	33.6	73.83

Appendix 3. The results for the basic model

ESG Rating	Coefficient	Standard Error	t-value	p-value	95% confidence interval		Significance
Policy independence	0.403	0.179	2.26	0.024	0.053	0.754	**
Non-Executive members, %	0.006	0.003	1.96	0.05	0	0.013	*
CEO Chairman sepation	−0.527	0.202	−2.61	0.009	−0.923	−0.131	***
CEO is a board member	−0.375	0.234	−1.60	0.11	−0.834	0.084	
Chairman is ex-CEO	0.656	0.192	3.42	0.001	0.28	1.033	***
CSR committee	1.747	0.172	10.18	0	1.41	2.083	***
Percent of women on board	0.013	0.007	1.78	0.075	−0.001	0.028	*
Female CEO	−0.011	0.383	−0.03	0.978	−0.761	0.74	
Female Chairperson	0.528	0.449	1.17	0.24	−0.353	1.408	
Age range	0.007	0.009	0.76	0.448	−0.01	0.024	
Average age	0.008	0.021	0.38	0.707	−0.033	0.049	
Governance score	0.748	0.035	21.13	0	0.678	0.817	***
Mean dependent var	7.872		SD dependent var			2.239		
Pseudo r-squared	0.234		Number of obs			839.000		
Chi-square	851.855		Prob > chi2			0.000		
Akaike information criterion (AIC)	2838.707		Bayesian information criterion (BIC)			2947.548		

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Appendix 4. Results for basic model

Variable	Logit coefficient	Odds ratio
Policy independence	0.403** (0.179)	1.497** (0.268)
Non-executive members, %	0.00649* (0.00332)	1.007* (0.00334)
CEO Chairman separation	−0.527*** (0.202)	0.590*** (0.119)
CEO is a board member	−0.375 (0.234)	0.687 (0.161)
Chairman is ex-CEO	0.656*** (0.192)	1.927*** (0.370)
CSR committee	1.747*** (0.172)	5.737*** (0.985)
Percent of women on board	0.0132* (0.00745)	1.013* (0.00755)
Female CEO	−0.0105 (0.383)	0.990 (0.379)
Female Chairperson	0.528 (0.449)	1.695 (0.761)
Age range	0.00661 (0.00870)	1.007 (0.00876)
Average age	0.00788 (0.0209)	1.008 (0.0211)
Governance score	0.748*** (0.0354)	2.112*** (0.0747)
Observations	839	839

Note: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; standard errors in parentheses.

Appendix 5. Results for European companies

Variable	Logit coefficient	Odds ratio
Policy independence	0.802**	2.229**
	(0.337)	(0.752)
Non-executive members, %	0.0520***	1.053***
	(0.0169)	(0.0178)
CEO Chairman separation	−0.262	0.769
	(0.717)	(0.552)
CEO is a board member	0.0733	1.076
	(0.453)	(0.487)
Chairman is ex-CEO	0.0452	1.046
	(0.666)	(0.697)
CSR committee	1.915***	6.788***
	(0.438)	(2.976)
Percent of women on board	−0.00189	0.998
	(0.0138)	(0.0138)
Female Chairperson	−0.745	0.475
	(1.589)	(0.754)
Age range	0.0644***	1.067***
	(0.0203)	(0.0217)
Average age	0.180***	1.197***
	(0.0550)	(0.0658)
Governance score	0.650***	1.915***
	(0.0786)	(0.151)
Observations	180	180

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; standard errors in parentheses.

Appendix 6. Results for Asian companies

Variable	Logit coefficient	Odds ratio
Policy independence	0.824***	2.279***
	(0.264)	(0.603)
Non-executive members, %	0.0210***	1.021***
	(0.00574)	(0.00586)
CEO Chairman separation	−0.818***	0.441***
	(0.284)	(0.125)
CEO is a board member	−0.102	0.903
	(0.853)	(0.771)
Chairman is ex-CEO	1.030***	2.801***
	(0.267)	(0.748)
CSR committee	1.809***	6.104***
	(0.293)	(1.791)
Percent of women on board	−0.0234	0.977
	(0.0197)	(0.0192)
Age range	−0.0303**	0.970**
	(0.0138)	(0.0134)
Average age	0.0547	1.056
	(0.0351)	(0.0370)
Governance score	0.728***	2.071***
	(0.0573)	(0.119)
Observations	358	358

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; standard errors in parentheses.

Appendix 7. Results for American companies

Variable	Logit coefficient	Odds ratio
Policy independence	3.997***	54.43***
	(1.072)	(58.33)
Non-executive members, %	−0.0229	0.977
	(0.0154)	(0.0150)
CEO Chairman separation	−0.539	0.583
	(0.430)	(0.251)
CEO is a board member	−1.238	0.290
	(1.609)	(0.466)
Chairman is ex-CEO	0.789**	2.202**
	(0.376)	(0.829)
CSR committee	1.218***	3.382***
	(0.268)	(0.905)
Percent of women on board	0.0446***	1.046***
	(0.0140)	(0.0147)
Female CEO	0.147	1.159
	(0.412)	(0.477)
Female chairperson	0.425	1.530
	(0.491)	(0.751)
Age range	0.0230	1.023
	(0.0196)	(0.0200)
Average age	0.0308	1.031
	(0.0383)	(0.0395)
Governance score	0.871***	2.389***
	(0.0685)	(0.164)
Observations	304	304

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; standard errors in parentheses.

Appendix 8. Results for IT companies

Variable	Logit coefficient	Odds ratio
Policy independence	0.0968	1.102
	(0.276)	(0.305)
Non-executive members, %	0.0175***	1.018***
	(0.00529)	(0.00539)
CEO Chairman separation	−0.705**	0.494**
	(0.308)	(0.152)
CEO is a board member	−0.569	0.566
	(0.493)	(0.279)
Chairman is ex-CEO	0.754**	2.126**
	(0.297)	(0.632)
CSR committee	1.885***	6.584***
	(0.251)	(1.655)
Percent of women on board	0.0142	1.014
	(0.0118)	(0.0120)
Female CEO	0.406	1.501
	(0.418)	(0.627)
Female Chairperson	1.111**	3.037**
	(0.501)	(1.521)
Age range	−0.00345	0.997
	(0.0140)	(0.0139)
Average age	0.0522*	1.054*
	(0.0294)	(0.0309)
Governance score	0.867***	2.379***
	(0.0549)	(0.131)
Observations	419	419

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; standard errors in parentheses.

Appendix 9. Results for industrial companies

Variable	Logit coeff	Odds ratio
Policy independence	0.635**	1.886**
	(0.253)	(0.478)
Non-executive members, %	−0.00401	0.996
	(0.00465)	(0.00463)
CEO Chairman separation	−0.135	0.874
	(0.313)	(0.273)
CEO is a board member	−0.888***	0.411***
	(0.328)	(0.135)
Chairman is ex-CEO	0.758***	2.134***
	(0.268)	(0.572)
CSR committee	1.569***	4.800***
	(0.249)	(1.196)
Percent of women on board	0.0153	1.015
	(0.0101)	(0.0103)
Female CEO	−1.672	0.188
	(1.515)	(0.285)
Female Chairperson	0.957	2.603
	(1.572)	(4.093)
Age range	0.0147	1.015
	(0.0120)	(0.0121)
Average age	0.00549	1.006
	(0.0342)	(0.0344)
Governance score	0.698***	2.010***
	(0.0501)	(0.101)
Observations	420	420

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$; standard errors in parentheses.