Journal of
Risk and Financial Management

MDPI

Article

Exploring the Relationship between Corporate Governance, Corporate Social Responsibility and Financial and Non-Financial Reporting: A Study of Large Companies in Greece

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Abstract: Academics and professionals alike are highly interested in Corporate Social Responsibility (CSR), Corporate Governance (CG), environmental, social, and governance (ESG) and corporate non-financial reporting (CNFR) and how they can improve a brand's reputation, financial efficiency, and sustainability within businesses and organisations. The main objective of our study was to examine whether the financial data of large companies can be correlated with the data in their non-financial reports and provide information on the level of corporate governance and corporate responsibility and to examine the correlation between them. For this purpose, we conducted research by examining the 100 largest companies in Greece, over a period of 3 years, collecting both financial and non-financial data from their official reports. Using appropriate quantitative tools such as similarity, classification and econometric methods (stepwise method and panel least-squares method), the correlations between the data for CSR, CG and non-financial actions and key financial performance ratios are evaluated. Our research has revealed a strong link between financial performance and ESG actions of large companies and, in particular, we demonstrated the positive correlation of CSR performance with their total assets and whether they are listed on the stock exchange, and of CG with CSR and EBITDA. This study adds to the existing academic discourse on the relationship between financial and non-financial information of corporations in the areas of Corporate Responsibility and Governance and provides a valuable way to assess the decisions of businesses.

Keywords: corporate governance (CG); corporate social responsibility (CSR); sustainable development; financial reporting; non-financial reporting; environmental; social; governance (ESG) actions

Citation: Pagkalou, Foteini I., Christos L. Galanos, and Eleftherios I. Thalassinos. 2024. Exploring the Relationship between Corporate Governance, Corporate Social Responsibility and Financial and Non-Financial Reporting: A Study of Large Companies in Greece. *Journal of Risk and Financial Management* 17: 97. https://doi.org/10.3390/jrfm17030097

Academic Editor: Khaled Hussainey

Received: 28 December 2023
Revised: 18 February 2024
Accepted: 21 February 2024
Published: 23 February 2024

1. Introduction

In recent years, the concepts of corporate sustainability, corporate social responsibility, corporate social performance, environmental management and corporate governance have gained significant prominence from both academics and practitioners. All relevant information is reflected in companies' non-financial statements which, together with their financial statements, constitute the overall information of each company. Determining the qualitative and quantitative nature of the actions implemented within the framework of corporate responsibility of companies is a difficult task and is often considered in relation to other financial indicators.

A number of notable and important studies have identified a positive relationship between the financial and non-financial elements of companies in the areas of CSR and corporate governance (see, for example, Van Beurden and Gössling 2008; Wang 2010; Tarczyński et al. 2020), while studies by institutions such as CSR Europe also converge in the same direction.

Many scholars have chosen to link CSR to the financial and economic performance of companies, directing their research to listed companies and stock market indices. In this approach we find several studies on different countries and different stock exchanges that conclude a positive correlation between CSR and financial performance (see among others the study by López et al. (2007) on listed companies in the Dow Jones Sustainability Index and Dow Jones Global Index, Li et al. (2009) for Shanghai Stock Exchange listed companies, Nareswari et al. (2022) for the Indonesian stock exchange and Karagiorgos (2010) and Ziogas and Metaxas (2021) for Greek listed companies). However, there are also those that show a negative correlation, such as Harjoto (2007) and Nelling and Webb (2009), or do not reach firm conclusions.

Besides the aforementioned approach of assessing the relationship between CSR and corporate financial performance which has objective limitations for Greek data due to the limited number of listed companies compared to the total, what seems to be closer to the Greek reality is the evaluation of companies' CSR performance, depending on their financial performance, through the sustainability reports they issue.

Overall, despite the increased interest in the qualitative and quantitative identification of CSR and CG actions, as well as in determining the relationship between financial and non-financial information of companies, the literature is relatively limited and there has not been a commonly accepted measurement of these. Since the beginning of the 1990s Weber has demonstrated a way of capturing and quantifying the actions contained in CSR reports, which is still often followed today. More recently, Vouros et al. (2020) introduced their own method of CSR scoring with evaluation criteria and scale. Studies, such as the ones above but also those by Hawn and Ioannou (2016), tend to distinguish CSR actions into internal and external, often proceeding to an additional categorization of them, in order to separately study their correlation with other economic factors, finding differences in ratios.

However, there are no studies that holistically approach the issue of qualitative and quantitative determination of CSR and CG of companies by recording their actions, analysing them, measuring their results and correlating them with their purely financial data. Thus, the main objective of this study is to systematically record the corporate responsibility and environmental, social and governance (ESG) actions of the largest companies operating in Greece and to correlate them with their financial data.

More specifically, the objectives of this study are: i. To investigate the correlation between the individual criteria that shape the CSR and CG of the large companies in Greece with their financial data; ii. To assess whether this dynamic correlation is differentiated for CSR actions in the internal and external environment of the companies; iii. To examine other determinants that influence the CSR of firms, such as their listing on the stock exchange and the awards they receive in this area.

To investigate the above, we focused on the one hundred (100) largest companies operating in Greece. The survey period lasted from January 2019 to December 2021. In total and for the study period, data were collected for 11 variables regarding their financial situation and for 62 variables regarding their corporate responsibility and ESG actions. In particular, we divided their corporate responsibility initiatives into two categories, internal and external, further categorizing them into specific groups. We applied similarity analysis and the stepwise method and panel least-squares method.

The findings suggest that the correlation between CSR and financial size for large entities is positive, as was the case for those listed on the Athens Stock Exchange. On the other hand, the correlation between total sales and CSR is positive (although with a low correlation) only for CSR actions oriented towards the external environment of the companies, in particular those focusing on society, and negative for all other categories. It was also found that awards follow internal CSR, while being negatively correlated with all other CSR subcategories. Furthermore, corporate governance was shown to be influenced by the type of non-financial report companies have chosen to present their non-financial data, as well as by their total sales among the financial data we examined.

The results can have a significant impact for both investors and other stakeholders as this helps to understand and evaluate a company's performance in areas such as sustainability, ethics and social responsibility and can lead to optimal and rational decision-making and orientation of funds and actions.

The rest of the paper is organized as follows: Section 2 provides the literature review, while Section 3 describes the data and the methodology followed. Next, Section 4 details the methods used, Section 5 analyses the findings and Section 6 concludes the study.

2. Literature Review

All the information on CSR, corporate sustainability, corporate governance, etc. is reflected in the non-financial statements of the companies which, together with their financial statements, constitute the total information of each company.

Some common approaches to measuring CSR include: sustainability reporting, stakeholder engagement, external ratings and rankings and impact assessments. Overall, measuring CSR can be challenging, as it involves evaluating a company's impact on a wide range of stakeholders and factors, and there is no one-size-fits-all approach. The key is to identify the most relevant metrics and measurement methods for a given company and context, and to continually monitor and evaluate CSR performance over time.

Specifically, for non-financial statements, it should be mentioned that there is no specific standard or limitations; however, there are the various indicators and assurance standards that they can voluntarily incorporate. Also, as pointed out by Bouraoui et al. (2019), the methods of measuring CSR are controversial and this maintains the absence of a complete understanding of it. Meanwhile both the planning and implementation of CSR actions differ significantly by country and due to the legislative framework for companies and the financial issues they face, as well as a number of other factors that affect it. Therefore, a different approach and evaluation is required for each country (Van Marrewijk 2003; Campbell 2007; Tsourvakas and Yfantidou 2018). Moreover, a common admission of several CSR scholars is the difficulty in evaluating corporate social responsibility and sustainability reports that remain undefined and makes them non-comparable, while also requiring complex and non-homogenized tools for the determination and measurement of CSR level. As an example, we mention the relevant studies by Ellen et al. (2006), Calabrese et al. (2016) and Rim et al. (2018).

However, the common framework that applies to all is that those researchers who choose to deal with the measurement of the CSR character of companies first face the problem of qualitative measurement of this due to the absence of a uniform regulatory framework and then face the problem of quantitative measurement where there are numerous limitations. This is the main reason why in some publications researchers such as Gjølberg (2009) refer to Corporate Social Responsibility (CSR) as "measuring the immeasurable".

In recent years, corporate governance and ESG actions of companies have been added to the assessment of corporate social responsibility. The reason that this happens is because it has been proven that the ultimate goal of both—improving corporate governance and fulfilling corporate social responsibility—is to enhance corporate governance legitimacy, and indeed, corporate governance not only has the same basic content as corporate social responsibility, but also affects the quality of its disclosure. Studies, such as Leitoniene and Sapkauskiene (2015), Vartiak (2016) and Domingues et al. (2017), on the relationships between corporate governance, corporate social responsibility information disclosure and firm value, confirmed what was mentioned above and demonstrated the fact that CSR information is fragmented, diverse and multidimensional and needs special analysis to be transformed into valuable disclosure mechanisms, providing full information and new value for the public.

Also, we know that most of the academic research on CSR, CG and sustainable development issues focuses on large companies because it is easier to identify their actions, because large companies are more visible in society and it is easier to identify the stage of corporate responsibility they have reached, simply by looking at their sustainability reports, code of conduct and other policy documents or their participation in initiatives of various bodies (Wickert 2014). Measuring CSR performance often involves a combination of frameworks and metrics, depending on the industry and company's specific focus areas.

A multitude of studies link CSR to the financial performance of companies. James and Wooten (2005) have already highlighted the financial benefits of corporate responsibility for companies themselves, as a result of improving their overall image, customer confidence and the confidence of all stakeholders. Hohnen (2007) also emphasized the importance of CSR in the intangible assets of firms, Bakker et al. (2014) positively correlate it with profitability, and Lu et al. (2009) and Yuen and Lim (2016) report a positive correlation of corporate performance with the CSR level of firms, while Husted and Salazar (2006) proved the connection of social performance with profitability, confirming other empirical studies that had preceded them. Also, Tarczyński et al. (2020) confirmed the existence of a relationship between fundamental strength and company value that can be applied to many areas in the operation of any company, including CSR, allowing for sectoral comparisons and the determination of the company's market position over time. And Wang (2010) investigated the relationship between CSR and brand equity in a sample of international companies over a three-year period, concluding that good performance in corporate responsibility is correlated with the financial value of companies. The recent study by Nareswari et al. (2022) that examined the impact of ESG on corporate performance for non-financial companies listed on the Indonesian stock exchange demonstrated that in each case the implementation of ESG is reflected in their financial performance with positive impact in non-crisis periods and negative impact in crisis periods. The European CSR network argues that CSR investments can lead to higher financial returns and improved corporate profitability, and a number of studies agree. On the other hand, studies such as McWilliams and Siegel (2000), Brown et al. (2006), Harjoto (2007) and Nelling and Webb (2009) deny any link between CSR and financial performance.

However, in an attempt to link CSR with financial performance and to identify the correlation between them, most studies turn to listed companies and their respective stock market indices. The study by Mittal et al. (2008) on the listed companies of the Indian stock exchange and the S&P CNX Nifty index showed the positive correlation with the added market value; however, a negative correlation with the weighted average cost of capital index does not lead to firm conclusions. In the same direction are studies by López et al. (2007) for listed companies in the Dow Jones Sustainability Index and Dow Jones Global Index, Li et al. (2009) for listed companies in the Shanghai Stock Exchange in the services sector, Zhu (2011) for the Korean Stock Exchange, etc. The studies that support a negative correlation between CSR and a firm's financial performance are those that basically study the short-term financial benefits of firms. On the other hand, the literature study by Van Beurden and Gössling (2008), who conducted a comprehensive review on the topic, concluded that the majority of studies show a positive relationship between CSR and financial performance. In particular, as far as Greece is concerned, the empirical study by Karagiorgos (2010) that tested the impact of CSR performance on stock returns using voluntary disclosures, based on a sample of Greek listed companies, demonstrated their positive correlation, contributing to this direction. This was preceded by Panayiotou et al. (2009) who examined 28 listed companies through the CSR reports they had issued, but without reaching firm conclusions.

Yet this approach of assessing the relationship between CSR and the financial performance of companies has objective limitations for Greek data, due to the limited number of listed companies.

In relation to the Greek reality, the study by Sahinidis and Kavoura (2014), which examined the performance of companies operating in Greece in the field of CSR through an international tool based on Responsibility Indicators, demonstrated a two-way relationship between companies and the society in which they operate, although the content analysis revealed the lack of real communication of CSR activities. Along the same lines, Kim and Ferguson (2014) showed that companies promote CSR activities and communicate their projects to the public in a similar way to the sponsorships they give, but without taking into account consumers and target groups. Of increased interest is the research by Grougiou et al. (2016) which examined corporate social responsibility reporting strategies focusing on stigmatised firms belonging to the alcohol, tobacco, gambling, nuclear energy and firearms sectors and found that these firms are more inclined to issue independent CSR reports. This obviously helps us to draw the conclusion that as the risk of third-party litigation looms, the interest and likelihood of a company instigating CSR reports increases. In fact, through this study, it was shown that CSR disclosures are an integral part of the strategic objective of 'sinful' companies in order to distract attention from their controversial activities, reduce the negative effects of stigma and neutralize the impact of dispute resolution processes, which supports the dynamics of the visibility and positive impact of CSR actions by society as a whole. Important in this direction is the study by Panagopoulos et al. (2016), who investigated the perceptions of employees of companies on their corporate social performance, but also incorporated the perceptions of customers on our topic, as interpreted by employees, where it was shown that employees' evaluations of CSR are much more complex than those of customer–consumers. To determine the quality of this social information, it is important to identify the appropriate content of the CSR report.

However, although there is extensive literature on individual business activities and the need for financial reporting of the actions they implement in the context of their CSR in order to qualitatively capture the benefits gained by their stakeholders, there are no studies that quantify these benefits in numerical terms and compare them with the costs of CSR actions of companies for all activities and categories of companies and groups. Important in this direction is the study by Thalassinos and Liapis (2011) where, explaining the factors that play a key role in a financial, credit or debt crisis, they present a holistic regulatory framework for the banking sector based on European banks that are part of the EMU, stating that the regulatory framework for the banking sector should be characterised by transparency, accountability and performance in several important areas, including corporate financial reporting. Also, in another study by the same authors, in the same year, to assess the financial situation of the Greek banking system, they included, among other indicators in the model they constructed, corporate financial reporting, their corporate governance and the corporate social responsibility they have to demonstrate, thus affecting the economy, society and the environment. In particular, for the indicator they constructed for the CSR variable they relied on the annual mandatory corporate disclosures, taking values between 1 (for high involvement of CSR and sustainable development actions) and 15, for low values of the above. However, the findings of these surveys do not concern the whole economic activity, but are focused on the banking sector. Important is the study by Astara et al. (2017) that investigated the association between corporate social responsibility and financial performance studying 124 listed companies in the Athens Stock Exchange during the period 2006–2012 and showed that there is significant evidence. In the same direction, the more recent study by Ziogas and Metaxas (2021) that studied the association between CSR and financial performance during the crisis period through the CSR index confirms the majority of the literature that the adoption of CSR's good practices is not only a moral rule, but contributes at least partly to the development of their effectiveness.

We find that the link between CSR and the performance of companies in the Greek reality focuses mainly on listed companies and the link with stock market indicators, rather than on the general profile of companies and their financial performance, focusing on the weaknesses of the quantitative determination of their corporate responsibility. Despite the few studies that focus on it, closer to the Greek reality seems to be the assessment of the performance of companies also in the CSR sector, in proportion to their financial performance, through the sustainability reports that they issue. This methodological approach requires the use of appropriate methodological tools in order to bend the difficulties in evaluating CSR performance that a number of scholars, such as Carroll (2000) and Skouloudis et al. (2015), have mentioned.

The study by Hawn and Ioannou (2016) adds another parameter that should be taken into account in the assessment of CSR through criteria, that of the separation of corporate responsibility actions available to companies in external and internal actions. In fact, they recorded that the companies themselves focus mainly on the implementation of internal CSR actions, which seem to be associated with the best market value. The need to separately focus our study on each subcategory of CSR has been pointed out in the past by other researchers as well (indicatively, we cite Schaltegger and Wagner 2006).

In the systematization of CSR report data and the quantification of qualitative information, the contribution of the scoring method with specific criteria was initially mentioned by Weber (1990). Skouloudis and Nikolaou in 2020 moved in the same direction based on the GRI G2, while the recent study of Vouros et al. (2020) can be considered as an evolution of these with the GRI—G4 guidelines. In the study of Vouros et al. which collaborated with the EHRC of the University of the Aegean, a specific methodology has been developed and applied, based on specific evaluation criteria with a scale per criterion, depending on the degree of disclosure of information in CSR reports. In addition, they also defined specific weighting coefficients per criterion. Also, in the study by Diez-Cañamero et al. (2020) in the same period, a systematic recording of the indexes, rankings and ratings that are often used in matters of corporate responsibility and sustainable development is made. In fact, in their study, they also made an interesting consultation of the report "Rate the Raters 2019: Expert Views on ESG Ratings" of the consulting firm SustAinability. In a parallel manner, the recent study by Chen et al. (2021) which is focused on the US industrial stock market differs significantly from studies that use weighted evaluation scores of ESG policies to correlate them with their portfolio and financial data and other financial indicators. Specifically, they constructed a data envelopment analysis (DEA) model with quadratic and cubic terms to enhance the evidence of two or more aspects, as well as the interaction between the environmental, social, and governance attributes. Additionally, the study by Drempetic et al. (2019), who studied the influence of company size on the ESG score, is also important because of its methodology that used the Thomson Reuters ASSET4 ESG ratings to analyse the influence of firm size, as well as due to their findings that found a significant positive correlation between the mentioned variables. Following this, Cohen et al. (2000) noted that confidence in research conclusions increases with the number of methodological approaches contrasted.

Summarizing the study of the existing literature, as presented in this section, the link between CSR and CG, both between each other and each separately with the financial performance of companies, emerges. Also, there seems to be a variation in the association depending on whether we consider corporate responsibility actions directed to the internal activity of companies or when we refer to actions towards external parties, ESG actions. Finally, there are several studies that link CSR to stock market indicators.

The question, therefore, arises, which specific variables we should choose for our sample of firms, both in terms of their non-financial data (CSR, CG) and purely financial data, and what exactly we will examine with them. It seems logical to consult the empirical literature to determine an answer to this question.

In particular, for the financial data of companies, it seems that their own published reports give a direction, but the relevant literature also agrees that we should consider, among others: total sales, assets, earnings before interest and taxes (EBITDA) and debt liabilities (Harjoto et al. 2019; Cho et al. 2019; Qiu et al. 2016; Krüger 2015; Liao et al. 2015; etc.).

On the other hand, a number of studies, as well as institutions involved in implementation, training, evaluation and awarding in the fields of responsible business (European Business Network for Social Cohesion-EBNSC, CSR Europe, CSE, Quality Net Foundation, etc.), have come up with a number of subcategories that form the two main variables we will examine: CSR and CG. Building on these variables in our own study, we have tried to make as complete a record and mapping as possible, as documented in detail in Section 3.2.3.

Therefore, in our study we choose to consider these variables, to which we have already referred, adding one more which will outline whether a company is listed in the Athens Stock Exchange in general, without referring to individual stock market indices (LOA variable). Our objective is to investigate whether it is relevant to examine CSR and CG through its stock market performance.

Overall, this study extends the literature both in the assessment of corporate responsibility and corporate governance actions of companies with a holistic approach, and in their correlation with other non-financial elements.

Thus, we make the following assumptions:

Hypothesis 1. *The variables of corporate social responsibility and corporate governance are correlated with some main exogenous financial variables.*

Hypothesis 2. *There is a difference between internal CSR actions and ESG actions of large companies in how they relate to their financial and other non-financial data.*

Hypothesis 3. *The CSR and CG actions of large companies depend on and are influenced by other non-financial factors (for example, awards listed on Athex).*

3. Data Description and Methodology

For our study and the processing of our non-financial data (published company reports) we chose the method of content analysis, seeking to focus on the actual CSR actions implemented and the transformation of qualitative data into quantitative data and their categorization based on specific criteria. However, to quantify the data, it was not chosen to sum the criteria overall or by indicator, considering that it leads to significant measurement errors and has a high degree of subjectivity.

3.1. Sample Examined

In our research work, we used a sample of the hundred largest companies operating in Greece in various economic sectors. The study period was defined as the financial years 2019, 2020 and 2021, i.e., after the implementation of Law 4548/2018[1].

In this section we present the sample of organisations and companies selected, divided by entity size based on the numerical limits of employees according to Law 4308/14, excluding the very small entities that are out of sample. For each category we record whether they are listed on the Athens Stock Exchange or not and whether they have a formal report with non-financial data. All of the above are broken down by study year (Table 1).

Table 1. Profile of sample companies by financial year of study.

Financial Year/Number of Companies	Company Size (Number of Employees)					ATHEXGroup		CSR (Based on Reports)	
	Small Entities (10–49)	Medium-Sized Entities (50–249)	Large Entities (250–1000)	Large Entities (>1000)	No Data	Listed	Non-Listed	Implement	They Do Not Implement
2019	1	18	28	49	4	21	79	38	62
2020	1	18	26	50	5	19	81	42	58
2021	1	18	28	49	4	20	80	45	55

3.2. Data Collection

In order to arrive at the 100 largest companies[2],we firstly gathered data from their financial statements. After we came up with the 100 largest companies operating in Greece throughout the study period, we then collected information from their non-financial statements on the areas of corporate governance and corporate social responsibility and/or sustainable development. Unlike other researchers who obtain data for their research from both official company websites and any published information, we chose, for the sake of credibility, to limit ourselves exclusively to the official reports submitted by the companies, either in the form of a social report/CSR report/sustainable development report, or as part of their consolidated reports. Furthermore, we chose not to make an overall rating of the CSR criteria we examined, nor the approach of assigning weighting coefficients per criterion, considering that these are purely personal assessments without the possibility of calculating the error and the margin of error they contain. At this point, we must point out that our methodology is based on an assessment of the information in the reports we have collected, but we do not know whether this is true. In order to assess, to a greater extent, the reliability of the information provided, we have also chosen to record whether, and to what extent, each report and its contents have been submitted for external evaluation. In particular, we set the value 0 if the report has not been assessed by an external body/auditor, value 1 if the report has been assessed but only on the basis of the content they have been given and a value of 2 if it has been assessed both on the basis of the report and with additional audits (Figure 1).

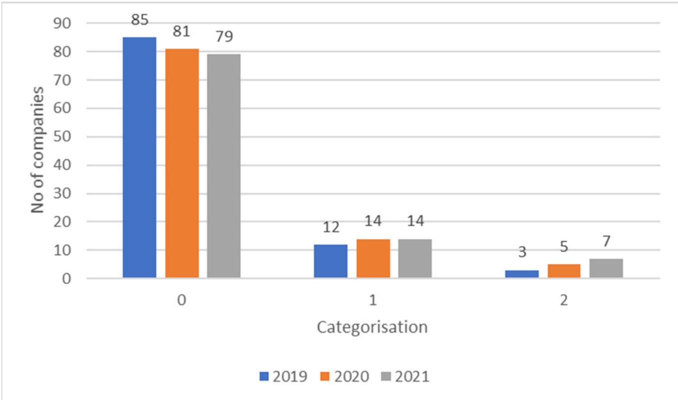

Figure 1. External evaluation of the companies' CSR.

One first observation we note is that more and more companies choose to have their accounts certified by qualified external bodies and experts, emphasizing the quality of the information and how it is recorded and captured.

3.2.1. Data from Financial Statements

For our sample, we examined and recorded data from the companies' financial reports, namely: turnover, earnings before interest and taxes (EBITDA), assets, debt liabilities (short-term debt, long-term debt, total debt), EBITDA margin, immediate liquidity and current ratio of total assets expressed in millions of euros, as well as days of claims. We also gathered general information about the companies, such as whether or not they are listed on the Athens Stock Exchange and the number of employees.

The most significant variables of the above quantities and those which will be audited subsequently are as follows[3]:

TS: total sales, in millions of euros
EBI: EBITDA, in millions of euros
ASS: assets, in millions of euros
LOA: listed on the Athex, where

$$\text{LOA} = \begin{cases} 0, & \text{not listed on the Athens Stock Exchange} \\ 1, & \text{listed on the Athens Stock Exchange} \end{cases}$$

3.2.2. General Data from the Non-Financial Statements and Classification

Regarding CSR, from the corporate responsibility reports for all 100 companies in the sample, we collected data on: the type of report they issued, whether they separately recorded information related to their corporate governance, and how they measured the performance of their companies, such as awards for their CSR actions.

The coding of the scoring system we followed for each variable related to the CSR and CG of the companies is presented in Appendix A, in an attempt to group the qualitative information contained in the reports and to be able to make a comparative study of them.

The variables of the above quantities are as follows:

(A) The following is general information related to the CSR Reports of the sample companies.

RCD: type of report with CSR data, where the relevant values and their justification are listed in the following table (Table 2).

Table 2. The variable type of report with CSR data (RCD) with corresponding values.

Values	Justification
0	Absence of report
1	Corporate Responsibility report
2	Corporate Social Responsibility report
3	Sustainable Development report
4	Sustainable Development and Corporate Responsibility report
5	Sustainable Development and Corporate Responsibility report with financial information
6	Other

The choice of recording the type of non-financial information report was made in order to find out in practice whether what is recorded in the literature is true, i.e., that companies have moved from corporate responsibility to sustainable development. Indeed, the theory was confirmed even for the short study period of three years and we found that while most companies started to issue corporate responsibility or CSR reports, they have now moved to issuing sustainable development reports and this is not only a change of title, but also changes the essence of where CSR is going.

(B) The following is information related to the measurement of CSR performance of the sample companies.

Next, we examined whether each company had been awarded recognition for even one of the CSR criteria we had set. We note that many companies, acting misleadingly and in order to cover up the absence of awards for actions related to their corporate responsibility, included every award they had received, even for financial years not related to the report in question. Our recording and capturing only concerned the study year and whether or not they were given an award for CSR or sustainable development actions, directly or indirectly. Below is a detailed analysis of the values that the sample could obtain for the criterion under consideration.

AD: awards/distinctions, where the coding of their scoring system is listed in the table below (Table 3).

Table 3. The variable awards/distinctions (AD) with corresponding values.

Values	Justification
0	If the company or organization has not been given an award for CSR actions
1	If the company or organization has been given an award for at least one CSR element by a Greek organization, without a specific methodology
2	If the company or organization has been given an award for at least one CSR element by a Greek organization, on the basis of a specific methodology
3	If the company or organization has been given an award for at least one CSR element by a Greek organization, on the basis of a specific methodology and with expert assessors

Table 3. *Cont.*

Values	Justification
4	If the company or organization has been given an award for at least one CSR element by a foreign body, without a specific methodology
5	If the company or organization has been given an award for at least one CSR element by an external body on the basis of a specific methodology
6	If the company or organization has been given an award for at least one CSR element by an external body on the basis of a specific methodology and with expert assessors
7	If the company or organization has been given an award for at least one CSR element by both a Greek organisation and a foreign organization, without a specific methodology
8	If the company or organization has been given an award for at least one CSR element by both a Greek and a foreign organisation, with a specific methodology
9	If the company or organization has been given an award for at least one CSR element by both a Greek and a foreign organisation, with a specific methodology and with expert assessors

(C) The following is information on how CSR actions are reflected in the reports of the sample companies.

CG: elements for corporate governance, containing general information on corporate governance and taking the prices per case as they are presented in the following table (Table 4).

Table 4. The variable elements for corporate governance (CG) with corresponding values.

Values	Justification
0	If it does not report any information on the indicator
1	If it describes in general terms
2	If the indicator is described without quantitative information
3	If there is information relevant to the indicator and it is described in both monetary and quantitative terms
4	If the efficiency/benefit/effectiveness of the indicator is documented, without quantification
5	Whether the efficiency/benefit/effectiveness of the indicator has been measured

3.2.3. Data from the Non-Financial Statements by CSR Sector and Classification

In particular, and with regard to their actions in the context of their corporate responsibility, these were divided into internal CSR (variable CSR_{inter}) and external CSR (variable CSR_{esg}) and each of them into individual sub-actions.

Specifically, the CSR actions per sector recorded are as follows:

- For internal CSR, these fields: employees, diversity, labour rights, trade union treatment, compensation, benefits, training, occupational health and safety, supplementary insurance for employees, profit-sharing and equity schemes, information, consultation and participation in decision-making, working environment, management of natural resources and environmental impact, free time and parental protection.
- For external CSR and in relation to society (variable CSR_{com}): recruitment of people from vulnerable social groups, charity, donations, volunteering, protecting public health, contributing to and respecting the local economy and ecosystem, human rights, monitoring transparent operations throughout the supply chain, empowering young people, promoting culture, games and sports, reducing environmental costs in the production process, creating new market opportunities through new sustainable

technologies and production processes, making goods and services available to the public and the environment.

- For external CSR and in relation to the environment (variable CSR_{env}): taking measures to address climate change, developing and implementing renewable energy sources and other alternative environmental technologies, mitigating or avoiding co2 emissions etc., efficient use of resources in the manufacture of products and provision of services including suppliers, limiting the use of resources, materials, energy, water, steam, limiting packaging materials or the use of eco-friendly ones, reducing waste yield, recycling, limiting land use and respecting local ecological stability.
- For external CSR and in relation to corporate governance (variable CSR_{gov}): in terms of the Board (structure and composition, decision-making through experienced and independent members, benefits and incentives to achieve financial and non-financial targets), in terms of leadership ethics (stakeholder relations, fair treatment of shareholders, application of CSR and sustainability principles throughout the hierarchy and all day-to-day operations of the company) and in terms of transparency (application of international standards in reporting and accuracy, completeness and reliability of Sustainability or CSR Reports).

It is noted that the coding of all above variables is presented in the table below (Table 5).

Table 5. The variables CSR_{inter}, CSR_{esg} with corresponding values.

Values	Justification
0	If it does not report any information on the indicator
1	If it describes in general terms
2	If the indicator is described without quantitative information
3	If there is information relevant to the indicator and it is described in both monetary and quantitative terms
4	If the efficiency/benefit/effectiveness of the indicator is documented, without quantification
5	Whether the efficiency/benefit/effectiveness of the indicator has been measured

The equations that apply to the above variables are:

$$CSR = CSRinter + CSResg \tag{1}$$

$$CSResg = CSRcom + CSRenv + CSRgov \tag{2}$$

3.3. Methodology

Descriptive statistics techniques and methods were initially applied to the above variables related to the CSR and CG of companies, visualizing the results in graphs. This was followed by the similarity analysis and a dendrogram with the analysis of the groups of companies presenting a similar level of CSR.

Then, from the research data we collected and described above, we tried to investigate whether interdependence relationships develop between our main variables—corporate governance and corporate social responsibility—and their individual actions, but also with exogenous variables (financial and non-financial). Stepwise Regression and then Panel Data Regression were chosen as the assessment and approach methodology. Our data is Panel Data of 100 companies over 3 years and many alternative estimates could have been pursued and will be pursued in our future research. The criterion we used was the statistical significance at the level of at least 5% of the estimated coefficients extracted with the Stepwise Regression or with the Panel Data Regression estimates with the T distribution or with the p-criterion.

To test the above research models, the following functional interdependencies were developed based on the Stepwise Regression methodology:

$$CSR = c + b_1 LNASS + b_2 LOA \quad (3)$$

$$RCD = c + b_1 CG + b_2 LNEBI \quad (4)$$

$$CG = c + b_1 RCD + b_2 LNEBI \quad (5)$$

while, in the Panel data regression analysis, the following equation was obtained:

$$AD = c + CSR + F_i + \varepsilon \quad (6)$$

4. Estimation of CSR

From the previous detailed presentation of all the data recorded and examined for each company or organisation in the sample, it is clear that for our study period (fiscal years 2019, 2020 and 2021) eleven (11) purely quantitative variables and sixty-two (62) qualitative discrete variables were collected. Focusing on the qualitative variables, it should be noted that in cases that have more than two categories as an option, these follow the hierarchical proportional measurement scale and consequently zero as a measurement principle has real meaning and all numerical operations can be performed.

4.1. Descriptive Measures—Analysis

Some initial important observations emerged from the statistical treatment of the data and for the data collected from the non-financial reports of the companies or organisations.

- For the variable RCD (type of report with CSR data) it emerged that there is indeed a shift of companies to issue sustainable development reports (category 3) instead of the corporate social responsibility or corporate responsibility reports they used to issue in the past (Figure 2).

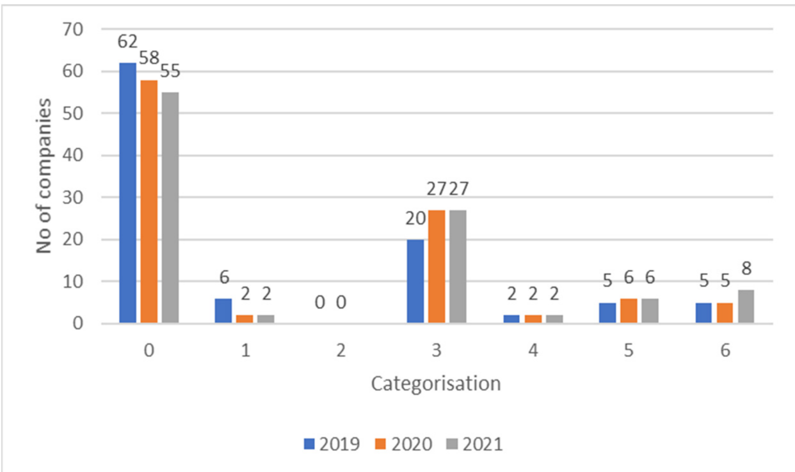

Figure 2. Type of report with CSR data.

- For the variable AD (awards/distinctions) we found that in the end the companies that have been given awards for the financial years we studied for initiatives they took or actions they implemented in terms of corporate responsibility and/or sustainable development are far fewer than expected based on what they themselves have promoted in their profiles and other media (Figure 3). Here, the huge gap that exists with regard to the standards of CSR reporting and the absence of a regulatory framework for compliance and an audit mechanism can be seen.

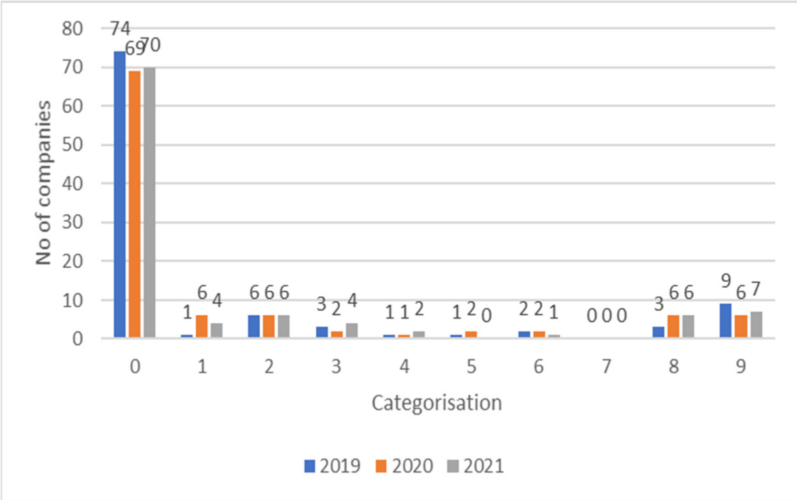

Figure 3. Awards/Honours.

- Finally, for the variable CG (elements for corporate governance) we find that from 2019 to 2021 there is a significant upward trend in both the companies reporting information related to corporate governance in their non-financial reports and in the quality of the information (Figure 4). However, because this indicator was also studied in subcategories, in detail, we do not expand further at this point.

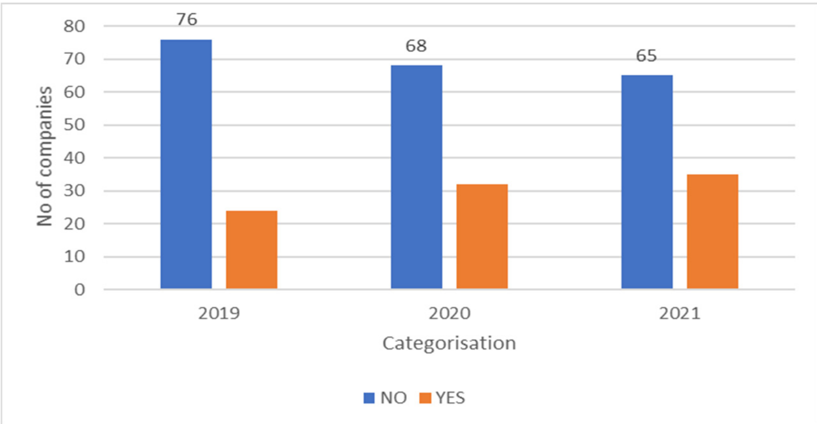

Figure 4. Elements for corporate governance.

4.2. Statistical Results and Initial Findings

4.2.1. Similarity Analysis

A similarity analysis for the CSR of the companies follows, distinguishing the companies in the sample into six clusters, with each cluster showing a similar level of CSR, starting from the best level of similarity defined as 1 and moving upwards (Figure A1).

Of the groups of companies in our sample, we find that companies in group 5 (Mytilineos and Eydap) are dominant, followed by those in group 6. Therefore, any company that wants to level up in its CSR and CG, or indeed in the way it records information around them, should consider which areas to focus on and which areas to improve. More specifically, these two first-ranked firms in fact are ranked much higher than the others and have common values on a number of variables, such as: employees, training, health and worker safety, participation in decisions, workplace, volunteering, development and implementation of RES and other alternative environmental technologies, mitigation or avoidance of emissions, effective use of resources in manufacturing products and providing services, reducing the use of materials, energy, water or steam, reducing environmental costs, recycling, and relationship with shareholders. At the operational level, these results may lead managers to implement CSR actions to a greater extent in order to enhance business market efficiency.

4.2.2. Stepwise Regression

Initially, we chose to follow the stepwise regression method, in which the iterative addition or removal of variables is followed until the regression model is fitted (highest R^2). We tested all financial variables with the Stepwise LS method and found that what influences their level of corporate responsibility is whether they are listed or not on the Athex (LOA variable) and the size of the companies/organizations. In particular, for their size, and in order to be able to avoid measurement errors, we chose the logarithm of total assets (variable LNASS). This data transformation occurred to reduce the heteroscedasticity problem (Gujarati and Bernier 2004).

An initial first finding is that CSR is influenced by the size and financials of a firm, as well as by whether it is listed or not. In more detail, it was found that all CSR subcategories depend on total assets and whether they are listed or not, and only upon looking at the external CSR of the firms concerning actions for society did it appear that total sales (variable TS) also played a role, but with a low correlation. If a company was listed in ATHEX then the CSR index was increased by 28 units approximately and if the total assets (ASS) of a company were raised by 1%, then the CSR index was increased by 0.11 units approximately (Table 6). As a result, we conclude that a company being listed in ATHEX is the key factor for the better CSR index.

Table 6. Stepwise least squares.

Variables	Coefficient
Constant	−0.4934784 ***
LNASS	11.42148 ***
LOA	28.80878 ***
R^2	0.427368
F-stat	90.67817
D-W	1.1

Note: *** indicates significant at 0.01 level; ** indicates significant at 0.05 level; * indicates significant at 0.1 level.

With Equations (4) and (5) we estimate the relationship between RCD and CG and we find that the corporate governance has more influence on RCD than the reverse. Moreover, RCD is related to the log of EBITDA, specifically a 1% rise in EBITDA increases RCD by 0.0027 units (Table 7). In the same manner CG is related to EBI; a 1% rise in EBI increases the CG by 0.001 units (Table 8).

Table 7. Stepwise least squares.

Variables	Coefficient
Constant	−0.364607279432 ***
CG	2.45685829661 ***
LNEBI	0.271458941061 ***
R^2	47.11%
F-stat	109.1393
D-W	0.974

Note: *** indicates significant at 0.01 level; ** indicates significant at 0.05 level; * indicates significant at 0.1 level.

Table 8. Stepwise least squares.

Variables	Coefficient
Constant	−0.561844 ***
RCD	0.144365 ***
LNEBI	0.107269 ***
R^2	48.2244%
F-stat	121.0836
D-W	1.048

Note: *** indicates significant at 0.01 level; ** indicates significant at 0.05 level; * indicates significant at 0.1 level.

4.2.3. Panel Data Regression

We then followed the Panel Least-Squares method by setting the companies' awards (variable AD) as the dependent variable and selecting as independent variables: separately totalled CSR (CSR), internal CSR (CSRinter), total external CSR (CSResg), and separately the subcategories of CSRcom, CSRenv and CSRgov as the independent variables, testing the correlation. It was found that awards follow CSR and specifically CSRinter, while operating negatively with all other variables (CSRcom, CSRenv, CSRgov) allowing fixed effects. In fixed effects the slope coefficients are constant, but the intercept varies over individuals, which means that the model allows for different constants for each group (section). According to our result, with sufficient R^2 the coefficient of CSR is only 0.04 which means that 1 unit increase in the CSR indicator raises the AD award indicator only 0.04 units (Table 9). Thus, we conclude that the awards of each company mainly result from company specific characteristics (fixed effect) and much less from performance in CSR indicator.

Table 9. Panel least squares with cross-section fixed effects.

Variables	Coefficient
Constant	−0.376716 *
CSR	0.040086 ***
R^2	0.770976
F-stat	6.598049
D-W	2.71

Source: Authors calculations. Note: *** indicates significant at 0.01 level; ** indicates significant at 0.05 level; * indicates significant at 0.1 level.

5. Discussion

This research focuses on studying the relationship between the level of corporate social responsibility, sustainable development and corporate governance of the 100 largest companies operating in Greece and their financial data. Our sample period runs from January 2019 until December 2021. The data were drawn from the financial and non-financial reports published by the companies and organisations themselves.

The existing literature is significantly limited and focuses on individual issues regarding this topic, while we chose to take a holistic approach and to use quantitative measurement methods. Initially, the sample companies were selected based on their financial figures as published in their financial statements. Then, and for the same companies, we studied the content and the way in which they present information regarding the corporate responsibility actions they implement both internally in the companies and organisations and in their external environment. Next, we statistically processed the data and investigated the degree of correlation between the above-mentioned variables. The correlation between variables for their economic data and CSR performance was examined through correlation and regression analysis.

Overall, our findings confirm our first hypothesis and complement the previous empirical evidence of other researchers, who often focus on the financial performance of companies and find that their level of corporate social responsibility and corporate governance appears to be correlated with financial factors (Bakker et al. 2014; Yuen and Lim 2016; Nareswari et al. 2022). We further distinguished between CSR actions within companies and ESG actions towards their external environment, individually and overall, and found that small differences emerge, partially confirming our second research hypothesis. Specifically, it was found that all CSR categories depend on total assets and whether they are listed on Athex or not, while only the external CSR of companies is also affected by total sales, but with a low correlation. This finding is in line with the studies of Schaltegger and Wagner (2006) and Hawn and Ioannou (2016), among others, which suggest that companies' CSR actions should be examined separately and by category to investigate the external factors influencing them. Meanwhile, our third hypothesis was also confirmed, since there was a correlation of companies' awards with the overall corporate responsibility actions they implement, as well as their level of corporate governance with the type of non-financial data report they choose.

Additionally, by proving that the criterion of being a company listed on the Athens Stock Exchange was the key factor for a better CSR index, this has confirmed once more our third hypothesis and at the same time it acts as a booster regarding the orientation of research that studies the correlation of stock market indices with CSR, such as Panayiotou et al. (2009); Astara et al. (2017); and Ziogas and Metaxas (2021). Apart from these, secondary findings emerged during our study, mainly when recording and documenting the corporate responsibility actions of the companies in the sample.

In particular, and with regard to the reports they publish, there was a shift from CSR to sustainable development and an increasing trend of companies publishing reports voluntarily, above and beyond the legislation. However, a first key conclusion that emerged is that non-financial information is not presented in a specific uniform way for all companies, nor are they required to report comprehensive information. This is because there is no legislative provision for this and no uniform strategy and commitment by companies. In most of the cases, qualitative information was sufficient, as opposed to quantitative measurement of the nature of the CSR actions implemented, and there was no measurement of the dissemination of the impact they had on their beneficiaries. Another important observation that emerged is that companies in the same sector invested in the same areas, which were directly related to their areas of activity or to any aggravating action through their activities in specific fields. This observation also confirms the theory that CSR contributes to the creation of value for the company and helps to improve its corporate reputation. It should be noted, however, that there is also increased information around areas such as public health protection, but we cannot be sure that they are related to fixed company policies because the study years included the COVID pandemic and many company actions were oriented around this.

6. Conclusions

This study is a systematic evaluation of the corporate responsibility actions of the largest companies in Greece and a comparative study of these actions with a quantitative measurement of their character and a comparison of these actions with their financial data.

In comparing non-financial data with financial data, it was found that Corporate Social Responsibility (CSR) overall and by subcategories (internal, external) is influenced by the size, the EBITDA and financial data of a company, as well as by whether it is listed on the stock market or not. This is a very important finding for the ability of larger companies to implement CSR, but also for how listed companies have a higher level of transparency and control, and therefore a better and more complete level of information. Also, Corporate Governance (CG) is related to CSR reports and EBITDA. Another finding was that awards seemed to be influenced only by CSR actions that are internally oriented, while they were negatively correlated with all other categories. This can be a policy tool for the companies themselves, showing them the way where they should focus their actions if they want to directly improve their results in this area, which has been proven to improve their corporate reputation and turn everyone's eyes towards them.

In particular, we implemented two different econometric methods. Firstly, we made use of the stepwise method to decide which variables have more influence on the CSR indicator and we found that LOA, EBI and ASS have a significant influence on the CSR estimation. Using the same method (stepwise) and examining corporate governance we found that TS have a considerable influence on the CG estimation. Secondly, we used the Panel least-squares method, and we found that the awards for each company do not mainly arise from the CSR indicator but are predefined from other factors. We implemented similarity analysis among companies according to CSR indicators. From our results, the rank of our classification is from 1 to 6, starting from the best level of similarity defined as 1 and moving upwards. And we identified the main factors that a company needs to improve in order to move up the CSR index: a. For internal CSR (employees, training, health and worker safety, consultation and participation in decisions); b. For external CSR and in relation to society (charities, offers and volunteering); c. For external CSR and in relation to the environment (development and implementation of RES and other alternative environmental technologies, mitigation or avoidance of emissions, effective use or resources in manufacturing products and providing services, reduction in the use of materials, energy, water or steam, reduction in environmental costs, recycling); d. For external CSR and in relation to corporate governance (relationship with stakeholders).

This study contributes to the literature and assists those who have to make investment decisions by demonstrating the relationship between the level of corporate responsibility and sustainable development of a company and its financial results, and because our research base is constantly updated, it also allows the control of other cases and the longitudinal analysis of changes in corporate responsibility and governance.

Recommendations for Future Research

In the future the research methodology could be applied in other countries, mainly in Europe, in order to test its effectiveness and whether similar results will be obtained. For further research, it would be interesting to examine the sample companies by economic activity sector in order to study their behaviour and the orientation of their decisions in the areas of corporate social responsibility and corporate governance. Furthermore, there are several directions for future research and the biggest challenge of all, we believe, is to quantify these parameters and the correlation between them. In future research, we propose the implementation of alternative approaches such as discriminant analysis to evaluate the results and an artificial neural network to include in the model and the effect of categorical variables, which was the biggest challenge we faced.

Author Contributions: F.I.P. conceived the idea and collected the data. F.I.P., C.L.G. and E.I.T. decided the methodology and did the analysis of it. F.I.P. undertook the preparation of the text, final editing was undertaken by F.I.P., C.L.G. and E.I.T. E.I.T. checked the empirical evidence and undertook the editing and supervision of the project. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: The data we used for our estimations are available on the websites of the companies, as mentioned in Appendix C.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Table A1. The variables with corresponding symbols.

Symbols	Variables
TS	total sales
EBI	EBITDA
LNEBI	logarithm of EBITDA
ASS	assets
LNASS	logarithm of assets
LOA	listed on the Athens Exchange Group
RCD	type of report with CSR data
AD	awards/distinctions for CSR actions
CG	elements for corporate governance
CSR	total CSR
CSR_{inter}	internal CSR
CSR_{esg}	external CSR
CSR_{com}	external CSR in relation to society
CSR_{env}	external CSR in relation to environment
CSR_{gov}	external CSR in relation to corporate governance

Appendix B

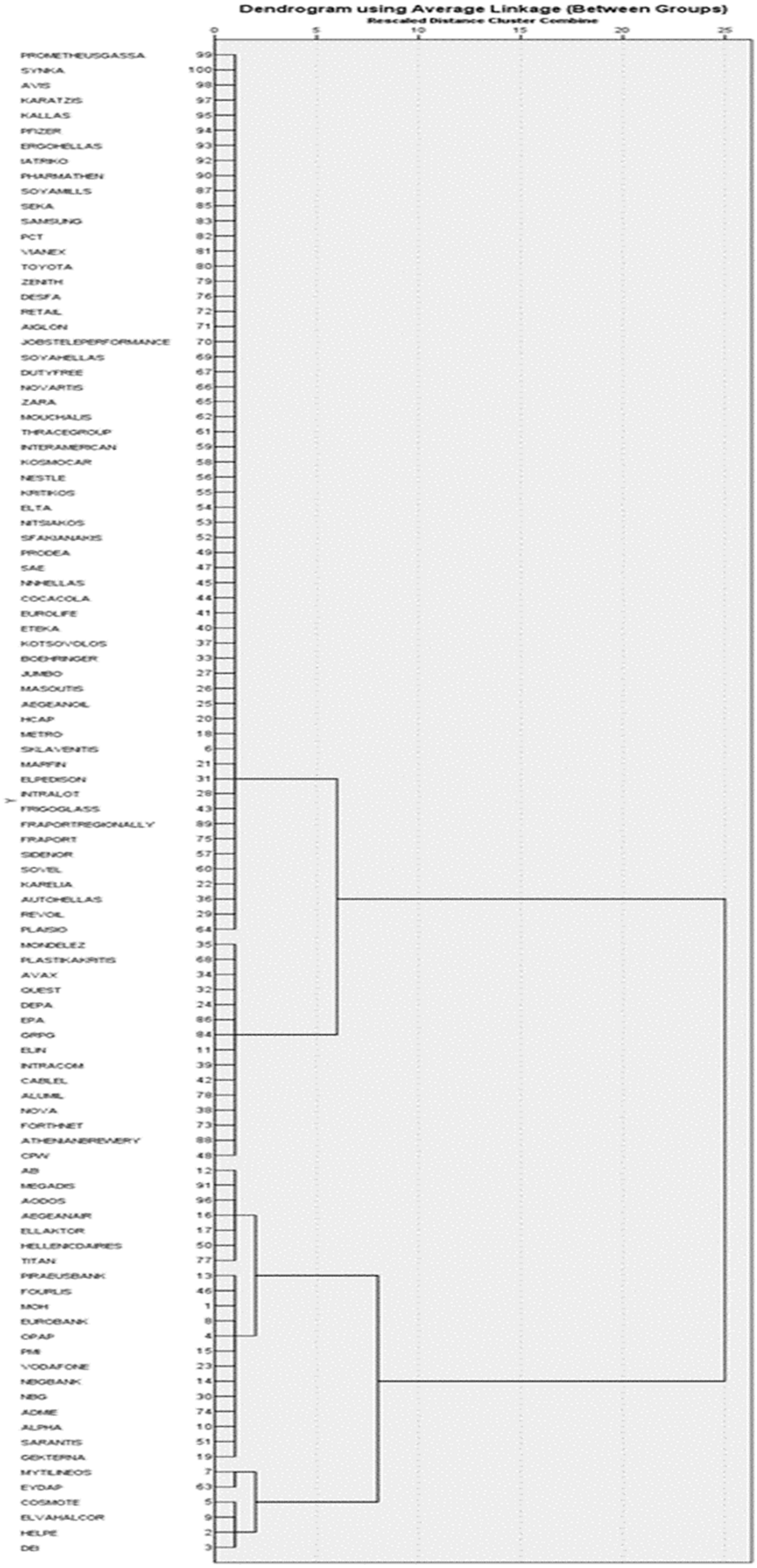

Figure A1. Dendrogram using Average Linkage.

Appendix C

Links from the sites of the companies in the sample.

www.moh.gr.
www.helpe.gr.
www.dei.gr.
www.opap.gr.
www.cosmote.gr.
www.sklavenitis.gr.
www.mytilineos.com.
www.eurobank.gr.
www.elvalhalcor.com.
www.alpha.gr.
www.elin.gr.
www.ab.gr.
www.piraeusbank.gr.
www.nbg.gr.
www.pmi.com.
www.el.aegeanair.com.
www.ellaktor.com.
www.metrocashandcarry.gr.
www.gekterna.com.
www.hcap.gr.
www.marfininvestmentgroup.com.
www.karelia.gr.
www.vodafone.gr.
www.depa.gr.
www.aegeanoil.com.
www.masoutis.gr.
www.e-jumbo.gr.
www.intralot.com.
www.revoil.gr.
www.elpedison.gr.
www.quest.gr.
www.boehringer-ingelheim.gr.
www.avax.gr.
www.mondelezinternational.com.
www.autohellas.gr.
www.kotsovolos.gr.
www.nova.gr.
www.intracom.com.
www.eteka.gr.
www.eurolife.gr.
www.cablel.com.
www.frigoglass.com.
www.coca-cola.gr.
www.nnhellas.gr.
www.fourlis.gr.
www.5ae.gr.
www.cpw.gr.
www.prodea.gr.
www.hellenicdairies.com.
www.greece.sarantisgroup.com.
www.sfakianakis.gr.
www.nitsiakos.gr.
www.elta.gr.
www.kritikos-sm.gr.
www.nestle.gr.
www.sidenor.gr.
www.kosmocar.gr.

www.interamerican.gr.
www.thracegroup.com.
www.mouchalis.com.gr.
www.eydap.gr.
www.plaisio.gr.
www.zara.com.
www.novartis.com.
www.athens.shopdutyfree.com.
www.plastikakritis.com.
www.soyahellas.gr.
www.jobsteleperformance.com.
www.aiglon.gr.
www.retail.gr.
www.admie.gr.
www.fraport-greece.com.
www.desfa.gr.
www.titan.gr.
www.alumil.com.
www.zenith.gr.
www.toyota.gr.
www.vianex.gr.
www.pct.com.gr.
www.samsung.com.
www.gr.pg.com.
www.seka.com.gr.
www.soya-mills.gr.
www.athenianbrewery.gr.
www.pharmathen.com.
www.megadis.gr.
www.iatriko.gr.
www.ergohellas.gr.
www.pfizer.gr.
www.kallasinc.com.
www.aodos.gr.
www.karatzis.gr.
www.avis.gr.
www.prometheusgassa.gr.
www.synka-sm.gr.

Notes

1. Greek law 4548/2018 on the disclosure of non-financial information (NFI) and Circular No. 62784/06-06-2017 of the Ministry of Economy and Development, developed in accordance with the provisions of Directive 2014/95/EU of the European Parliament, require large companies to disclose specific information on how they operate and manage their environmental and social challenges.
2. The links from the sites of the sample companies from which all the information was extracted are listed at the end of the bibliography in a separate subsection.
3. The totals of the variables examined are presented in Table A1 of Appendix A together with their symbolism.

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