



# Article Financial Stability in Companies with High ESG Scores: Evidence from North America Using the Ohlson O-Score

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**Abstract**: The benefits and advantages of the incorporation of ESG (Environmental, Social, Governing)related policies have been discussed extensively. However, research articles focus not only on the socioecological aspects of Corporate Social Responsibility (CSR) but also on the underlying effects on a corporation's corporate financial performance (CFP). In this regard, the current study aims to analyze the impact of ESG parameters on corporations' financial stability. A sample size of 691 companies in North American countries was investigated in order to test the hypothesis that ESG has an effect on the likelihood of a company going bankrupt using the Ohlson O-score. This is conducted using regression models and the Pearson correlation coefficient. Furthermore, a follow-up hypothesis on the relationship between firm size and ESG is also tested in order to evaluate a tendency of corporate growth through ESG-based sustainable development. The results of the study conclude that the governing pillar of ESG factors has the highest positive impact on corporations' financial success. Furthermore, the analysis conducted in the study with its sample size confirms the hypothesis that larger firms tend to have higher ESG scores.

**Keywords:** corporate social responsibility; probability of bankruptcy; corporate financial performance; ESG score; sustainability

# 1. Introduction

The Environmental, Social, and Governance (ESG) score is an innovational method of evaluating a company's activities. It provides insight into the organization's ability to uphold its Corporate Social Responsibility (CSR). The ESG score focuses not on financial reporting, which investors and managers are accustomed to using when making decisions, but statements on the corporation's influence on the underlying pillars of the score.

Whilst ESG reporting allows to conduct ethical investing, the implications of ESG also piqued interest regarding its possible correlation with higher company financial performance (CFP), stock returns, and other financial aspects of the corporation. As a result, many studies aim to conclude whether a firm connection between CFP and ESG can be determined [1–3]. Different methods are utilized in order to provide definitive results. However, depending on the choice of analysis objects and methods, the conclusions often vary, and it can be proposed that a consensus between researchers has not yet been reached.

This is explained by the relatively young nature of ESG evaluation. That being said, in order to develop this aspect of a corporation's activity, it is important to understand the effects that CSR and ESG have on CFP. If it proves to have a positive impact on a company's



Citation: Lisin, A.; Kushnir, A.; Koryakov, A.G.; Fomenko, N.; Shchukina, T. Financial Stability in Companies with High ESG Scores: Evidence from North America Using the Ohlson O-Score. *Sustainability* 2022, *14*, 479. https://doi.org/ 10.3390/su14010479

Academic Editor: Alexey Mikhaylov

Received: 30 November 2021 Accepted: 30 December 2021 Published: 3 January 2022

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**Copyright:** © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). financial performance and stock returns, the ESG score will be an integral part of investing in general, not just ethical. Furthermore, companies will have an extra inventive to pursue the best possible performance in this aspect of corporate activity.

This article studies the correlation between ESG performance and a company's probability of default. A similar study has been conducted, which exclusively includes US corporations and utilizes the Altman Z-score method of predicting a corporation's probability of becoming bankrupt [4]. The novelty of this research paper, however, consists of utilizing the Ohlson O-score to examine the market of North America: the USA, Canada, and Mexico. Data is gathered for the last 10 fiscal years, for the period from 2011 to 2020. North America is studied in the article due to the region encompassing countries which have developed ESG reporting and high levels of disclosure, specifically, the United States of America. Furthermore, the whole continent is investigated in order to expand on research from previous authors [1–4]. Future articles could look for different methods of grouping sample countries, focusing not on geographic parameters, such as in this one, but, for example, benchmarks of countries' economic development, thus including European states, Australia, and others.

The results of utilizing this innovative research method are then compared to the conclusions drawn in previous studies, which are presented in the following section, the Literature Review. Authors conduct analysis with different methods, investigating whether the results are consistent across different data sources, regions, company sectors, etc.

The research paper has the following structure: Section 2 features information on past literature regarding ESG. Section 3 details the data being used in the study as well as the utilized analysis methods. Section 4 presents the results of the study. Section 5 draws the article's appropriate conclusions.

### 2. Literature Review

#### 2.1. ESG Score: Concept and Components

The ESG score is comprised of an aggregate of three different aspects of a corporation's operations: the Environmental, Social, and Governance factors. Rating agencies look to integrate metrics into evaluating the level of responsibility of a company regarding these factors. As a result, the ESG score concept is to acknowledge companies practicing CSR, inadvertently pressure other corporations into increasing their CSR efforts, and give investors the necessary tools and evaluations to conduct ethical, socially responsible investing and increase CSR-related disclosure and reporting from companies [5].

The data used in the present article are from Thomson Reuters Eikon. They provide detailed information on the constituents and underlying indicators affecting the corresponding ESG score. Consequentially, it is crucial to review the Thomson Reuters' interpretation of the ESG score. To be more precise, the Environmental pillar include objective parameters in terms of the efficiency of resource use, emissions, and innovations. The social pillar focuses on the structure of a corporation's workforce, its compliance with human rights, the community, and product responsibility. The Governance pillar is comprised of factors adjacent to the management of the company, its shareholders, and CSR strategy [6–8].

# 2.2. ESG Effects on CFP

The current study explores the effects of CSR incorporation on the underlying probability of a company's default. As a result, a key notion to examine is the impact that CSR has on CFP, as this could consequentially lead to smaller or bigger odds of a company becoming bankrupt. Thus, the current subsection reviews the body of literature specifically on CFP, as well as the stock returns of corporations.

Previous studies have often emphasized the correlation of ESG performance and the stock returns of corresponding securities. Some researchers have concluded that the effect of the ESG score on the profitability of assets is positive but relatively insignificant. Evaluating a company's activities based on its ESG score can be observed to have a higher impact on certain industries of the economy [9–15]. Studies of Chinese markets add to the

industry-specific rhetoric by assessing the effects of ESG scores of being more significant in the cases of private property when compared to the impact on state-owned enterprises. Moreover, state legislations are proposed in order to further the development of ESG and increase the significance of CSR from an investment and business standpoint. The effects of ESG in a particular sector are given an in-depth examination in other research papers, looking to evaluate this impact in corporations of the financial sector. Considering the point of view of other researchers, it can be highlighted that individual ESG factors have different effects on shareholder value creation of banking corporations. In particular, the Environmental and Governance aspects of the ESG score have a positive effect, whilst the Social column has a negative one [16–21].

Now, moving on from the review of the ESG impact on stock returns, it is vital to examine past literature on the link between this type of reporting to CFP. Studies have concluded that, in the cases of banks, the reporting indicator is often higher in institutions with high financial leverage and a large volume of assets. Moreover, in banks, only Environmental disclosure has been cited to have a positive impact on the performance of the underlying asset. However, for Social and Government aspects individually, a negative effect is observed [22,23]. This may be seen as a contradiction, as the previous paragraph referenced a different point of view on the individual effects of ESG factors, but these results can in fact coexist as: (a) in one case, the article is examining the connection between ESG and stock performance, whilst the other researches ESG and CFP; (b) these results illustrate the current developing nature of research on ESG, CSR—particularly their effects on underlying assets.

When addressing companies' CSR, one important factor to consider is the size of the firms. Research shows that this bias is especially prominent in the case of CSR disclosure [23]. The phenomenon is explained by authors through numerous factors, among which is the pressure facing larger corporations to disclose more information relating to CSR. That being said, the correlation between large corporations and their ESG performance is still being studied extensively [24]. This is important to the current article, as the results may include this bias.

Research shows that among investors in general, the most important aspect of an organization's CSR performance is that which is related to Governance. This should not come as a surprise, as this factor is directly related to the policies of the company regarding its organizational aspect [25].

The idea of a socially responsible company has also been juxtaposed with SIN stocks. Studies have shown that SIN corporations tend to be influenced by peer pressure among companies with traditional business activities. It is argued that SIN firms are inclined to focus on ESG more than competitors. However, the motivation of this is not to rebalance their moral component but rather to achieve a competitive advantage. Despite this, other research shows that, at the same time, SIN firms may be less responsible than peers. So, the ESG performance of this particular industry group is lower than that of companies associated with technology, resources, and other markets [26–28].

Studies focusing on the peculiarities of Germany also show that the Governance pillar has the highest impact on a firm's financial performance. Of course, this could be correlated with the longstanding practice of corporate governance disclosure in the country [29]. However, a similar analysis on Italian blue-chip firms concluded that there is no evidence of CSR impacting CFP [30]. In the case of Chinese companies—power generation corporations, to be more specific—the hypothesis of ESG performance having an effect on a company's financial success was confirmed [31]. This also coincides with similar results on studies on India [32].

The parameters of ESG indicators have often been expanded upon, including a new column highlighting controversies related to the corporation. Studies have also taken this aspect into consideration, analyzing the impact of this specific metric on financial performance. A strong negative relationship between financial performance and controversies had been evaluated. Furthermore, high ESG performance rarely compensates for an influx

of controversies, proving the significance of this parameter [33,34]. Thus, as has been proposed, controversies should also be included in future related studies.

A study on Korean firms concluded that high-ESG-performance corporations tend to perform 3.4% better in terms of financial activities [35,36]. In research articles that expand its sample size, including companies from all over the world and examining a reverse situation—the correlation of high CFP with CSR—it was concluded that the influence is strong and positive. This, as has been stated, may be related to larger, i.e., predominantly financially successful companies, who tend to disclose more information regarding the underlying parameters utilized in the analysis [37–39].

Studies have included methods of machine learning to firmly determine the correlation between CSR and CFP. As a result, an article utilizing this analysis method interpreted financial performance through efficiency parameters—a firm's return on assets (ROA) and return on equity (ROE). The relationship between ESG variables and the two financial indicators was supported. The article also proposed policy implications which consider all ESG pillars, highlighting the necessity of environmental innovation, employment productivity, the workforce's diversity and equal opportunities [40].

Furthering research on industry-specific patterns, studies have examined the discussed correlation in emerging market banks. Contrasting the results that mainly been mentioned, the Governance pillar has little effect on CFP. At the same time, Environmental and Social aspects of a company's activities have a positive on a banks' performance [41]. Considering the link that had already been drawn between large companies, their disclosure policies, and the consequential financial performance, this juxtaposition can be theoretically explained [42,43].

These research papers lead to the topic of the effect of the COVID-19 pandemic on the topic of discussion. It has been implied and concluded that although capital markets had experienced a sharp decline due to the economic consequences of the pandemic, the effects of the virus were softened in the cases of high-ESG-performing corporations [44–47].

## 2.3. ESG Impact on a Company's Probability of Bankruptcy

With these implications in mind, this study aims specifically to research the correlation between CSR with the corporations' financial stability and solvency. Thus, one of the key studies that this article references is one researching the correlation between ESG performance and the probability of company default [4]. The study in question features a sample size of 902 firms exclusively in the USA. In order to evaluate the probability of default, variables from the Altman Z-score are used [48]. The article concludes that the ESG aggregate and CSR of corporations should be considered by managers and investors when assessing the risks associated with credit.

Cooper and Uzun (2019) include in their study firms that went bankrupt in the time period between 2007 to 2014 [1]. As a result, it was concluded that companies with high levels of CSR indicators are less likely to become bankrupt. Furthermore, the authors draw results on certain Governance principles affecting the probability of bankruptcy, Specifically, having a dual CEO/Chairman policy—where two different people hold those posts—increases the chance of the company filing for bankruptcy. This emphasizes the importance of the Governance pillar regarding the aggregate ESG score.

Habermann and Fischer's article also utilizes the aforementioned Z-score [3]. Moreover, the article increases the body of literature on the topic by examining and emphasizing CFP during different stages of the economic cycle—specifically, during an upswing. In this regard, the results contrast other research papers, determining that in the specific conditions of an economic upswing, higher performance in terms of CSR leads to higher bankruptcy probability.

Kamalirezaei et al. take a different approach when drawing conclusions on the CFP– CSR relationship [3]. It values the increased reputation of a firm with high values of the ESG score, which, in the long-term, increases sales and overall will have a net-positive impact on the corporation's financial performance. This, consequentially, translates to decreased risk of bankruptcy, however, as implied, not initially when incorporating CSR practices.

# 2.4. Article Hypotheses

This literature overview raises the question of potentially differentiating results regarding the CFP-CSR relationship in the case of utilizing other economic models and methods. The following hypotheses are tested in the article:

**Hypothesis 1.** *High ESG performance can be correlated with a decreasing probability of bankruptcy.* 

**Hypothesis 2.** *High ESG performance is correlated with a company's firm size—market capitalization, to be more specific.* 

Market capitalization is used to determine the company size over asset volume due to the first indicator including the evaluation of investors. Investors, as can be expected, play an integral part in determining the market capitalization of a company, so it encompasses not only the book value of the company, but the general investor sentiment of investors. Correspondingly, a company's ability to attract investors is important when determining the probability of it becoming bankrupt [49,50].

# 3. Data and Methods

In order to expand the literature on the topic of a high-ESG-performance corporation's financial stability, this article aims to expand the methods used to predict the firm's probability of bankruptcy. Ohlson's O-score aims to improve upon previous models of evaluating a company's probability of defaulting in the next two years [51–55]. The use of the Ohlson O-score is explained by the abundance of analysis using the Altman Z-score. The O-score aimed to improve upon the Altman model and used a larger sample size in its research to test the accuracy of the test [48,51,56–58]. The current study looks to answer the question of result consistency when utilizing a different method. The specific model utilized in the study is as follows:

$$O_s = -1.32 - 0.407\alpha_1 + 6.03\alpha_2 - 1.43\alpha_3 + 0.0757\alpha_4 - 1.72\alpha_5 - 2.37\alpha_6 - 1.83\alpha_7 + 0.285\alpha_8 - 0.521\alpha_9$$
(1)

where  $O_s$  is the company's O-score.  $\alpha_1$  is the log of the relation of a company's total assets to the country's gross national price index.  $\alpha_2$  is the relation of total liabilities to total assets.  $\alpha_3$  is the relation of working capital to total assets.  $\alpha_4$  is the relation of current liabilities to current assets.  $\alpha_5 = 0$  if a company's total assets are larger than their total liabilities—otherwise  $\alpha_5 = 1$ .  $\alpha_6$  is the relation of net income to total assets.  $\alpha_7$  is the relation of funds from operations to total liabilities.  $\alpha_8 = 0$  if the company had a net profit in the last two years—otherwise  $\alpha_8 = 1$ .  $\alpha_9$  is the relation of the difference of current net income and last period's net income to the sum of the module net income of the current period and the module of last period's net income.

The sample size also expands its reach in the context of previous studies—North American corporations from Canada, the USA, and Mexico are all reviewed. The only limitation was the following: a market capitalization larger than USD 30,000,000 and the availability of data on the company's ESG performance, as well as the required financial parameters. Thus, 691 companies were analyzed in the context of the current article. Furthermore, data for the period from 2011–2020 were gathered, resulting in a total of 6910 observations.

Thomson Reuters Refinitiv Eikon was utilized to obtain information on annual ESG scores, as well as for the individual pillars. Thomson Reuters collects over 400 data points on CSR-related factors and transforms them into 178 key performance indicators, which then constitute the Environmental, Social, and Governance pillars of the company's ESG score. The score itself ranges from 0.0 to 1 and is then translated to a justified grade. Each category of every one of the three pillars—Resource Use, Emissions, Innovation, Workforce, Human

Rights, Community, Product Responsibility, Management, Shareholders, CSR Strategy has a corresponding weight in the overall ESG score. The weight of each category is related to the number of indicators used in the scoring process. For example, Human Rights and CSR Strategy have the smallest weight—4.5%—and the fewest number of related indicators, whilst Management has the highest weight of 19% and, consequentially, the highest number of indicators, totaling 34 [5]. Articles show that these factors are best fit in analyses when lagged by a period [46]. As has been mentioned, some studies examine the effect of CFP on ESG ratings. In the case of the current study, the reversed situation is analyzed. Thus, ESG ratings are taken for a  $X_{t-1}$ , where X is the dependent variable—ESG scores and their underlying pillars—and t - 1 denoted a one-period lag of utilized data. In doing so, the effect of ESG performance on CFP is studied.

To be more specific, the methods utilized in the study are the following: the article's regression analysis is emphasized, with a model being presented in the next formula with the confidence level being 95%. The fit of the data is then evaluated and compared with Pearson's correlation coefficient. Thus, two sets of correlation coefficients are presented. Necessary conclusions based on the results are drawn out. The regression model:

$$O_{st} = \beta_0 + \beta_1 ESG_t \times \beta' X_t + \varepsilon_t.$$
<sup>(2)</sup>

where *t* is the year, *ESG* is the score of either the ESG variable, or the individual Environmental, Social, or Governance pillars.  $\beta'$ , as has been mentioned previously on similar topics, is additional for control variables by the vector *X* [4].

The used data lead to an underlying setback of this study, which is also featured in other research on the impact of CSR on CFP. The sample does not include companies that have already gone bankrupt, so the survivorship bias is prominent and not accounted for in the current article.

# 4. Results

The article features data on 691 North American companies and 6910 observations. The North American Industry Classification System (NAICS) sector name is provided for each country in order to provide clarity on the specific nature of company activities in these states (Table 1). Furthermore, the sum of the industry-specific companies and their domicile is provided in the table below.

Table 1. NAICS company sector breakdown for the article's 691 sample size.

NAICS Sector Name	USA	Canada	Mexico	Σ
Agriculture, Forestry, etc.	1	-	-	1
Arts, Entertainment	1	1	-	2
Construction	2	1	-	3
Educational Services	3	1	-	4
Finance and Insurance	16	4	-	20
Food Services	15	-	-	15
Health Care and Social Assistance	9	1	-	10
Information	45	11	2	58
Manufacturing	230	19	9	258
Mining, etc.	40	53	2	95
Other services	2	-	-	2
Real Estate and Rental and Leasing	9	8	-	17
Retail Trade	47	8	3	58
Technical Services	34	3	-	37
Transportation	20	11	1	32
Utilities	36	8	-	44
Waste Management	12	1	-	13
Wholesale Trade	16	6	-	22
Σ	538	136	17	691

The description of the variables' values can be observed in the descriptive analysis below (Table 2). The independent variables in the context of the conducted regression analysis is, as has been outlined, the ESG scores of corresponding companies, whilst the  $O_s$  is the dependent variable. The analysis was conducted with regard to the recommended and practiced one-year lag of the independent variables [1–4,6–11]. This is often implemented in order to review the effects of ESG on the company's consequential financial performance regarding the topic of CSR–CFP correlation.

**Table 2.** Descriptive analysis on the research's regression variables, including data on the dependent and independent variables.

Variable	obs.	Minimum	Maximum	Mean	Median	Standard Deviation
ln(TA/GNP)	6910	13.29393976	22.6556077	18.07789037	17.98124699	1.328154194
TL/TA	6910	-0.033303864	2.919128329	0.611619638	0.604737521	0.233677173
WC/TA	6910	-0.774021209	0.805020479	0.123773152	0.095643073	0.15424449
CL/CA	6910	0.030190299	46.45866957	0.823361064	0.662895691	1.092067016
NI/TA	6910	-0.728165251	0.562697256	0.065303471	0.059064293	0.068740066
FFO/TL	6910	-6.820982273	7.303295528	0.148849097	0.108405466	0.372157634
(Nit-Nit-1)/ ( Nit + Nit-1 )	6910	-1	1	0.001743507	0.028076454	0.324416369
Environmental Pillar	6910	0	98.54580592	41.45778312	42.0610691	28.43794078
Social Pillar	6910	0.479104204	98.11888653	50.28304846	49.61462394	22.25740378
Governance Pillar	6910	0.29209622	99.41169418	54.97992929	56.88219677	21.99691158
ESG Score	6910	0.51184547	94.04072679	49.28488824	49.3048802	20.0581286
O-score	6910	-22.31584649	8.089425216	-5.584279513	-5.447788448	1.759841012

The data are used to conduct the regression analysis. The regression coefficients are presented in the figures below (Figure 1).

The first verdict that should be initially mentioned is the fact that none of these correlation coefficients are negative. This indicates that, in line with the current model and data, the effect of ESG performance on a corporation's financial performance can be described as positive. Another aspect that is brought to attention is the sharp increase in the positive correlation between the variables. This is consistent with the conclusions of previous researchers, stating that the ESG performance increased its influence in the context of the global pandemic and consequential economic recession [1,4,19,31]. Furthermore, the findings hold up in the peculiarities of the most significant parameters affecting a company's financial performance: the Governance pillar has by far the largest correlation to CFP than any other parameter, with its correlation coefficient reaching a value of over 0.127 by the end of the sample period. This result is much higher than in the case of the overall ESG score, as well as each individual pillar. As has been stated, based on articles presented in the literature review, it can be said that the Governance pillar is in fact the most impactful and, simultaneously, has a positive effect.

Regarding the regression analysis, the line fit plot is presented in order to evaluate the quality of fit (Figure 2).

These findings can be further expanded upon by examining the results of the calculation of Pearson's correlation coefficients. The results are presented in the table below (Table 3).

The results of this table are different from those achieved through the regression model. Firstly, it features negative values. Interestingly, the Governance pillar is confirmed to be the variable with the most positive relationship with a company's probability of default with the confidence level at 95%. Moreover, the 2020 period in this model seems to also highlight the advantage of high ESG performance, as it is it has a positive impact on a corporation's financial stability.



**Figure 1.** Correlation coefficient of regression analysis for (**a**) ESG score's impact on probability of default, (**b**) E–score's impact on probability of default, (**c**) S–score's impact on probability of default, (**d**) G–score's impact on probability of default.



**Figure 2.** Regression analysis plot lines for (**a**) ESG score's impact on probability of default, (**b**) E–score's impact on probability of default, (**c**) S–score's impact on probability of default, (**d**) G–score's impact on probability of default.

Variable	2012	2013	2014	2015	2016	2017	2018	2019	2020
ESG	0.011802	-0.04249	-0.02091	-0.0623	-0.05227	-0.03825	0.012419	-0.03054	0.042666
Е	0.009035	-0.03846	-0.01174	-0.03664	-0.02069	-0.02889	-0.00752	-0.00597	-0.02338
S	-0.03011	-0.07476	-0.05536	-0.11685	-0.08323	-0.03676	-0.03597	-0.05299	-0.037128
G	0.062394	0.01293	0.027202	0.052149	0.010769	0.037611	0.011613	0.00196	0.036748

Table 3. Pearson's correlation coefficient of the article's dependent variables with O-score.

Thus, whilst a concrete answer on the peculiar effects of the Environmental and Social pillars has not been established—as this question continues to have mixed opinions—it can be said in the case of North American companies that there is a correlation between overall ESG performance and financial stability. This impact is strengthened under the effects of the Governance pillar in particular. Thus, the confirmation of the first hypothesis is mixed, as the results do not provide a cohesive answer across all of the ESG pillars and the ESG score itself. However, the Governance pillar, as implied in previous studies, does have the strongest positive effect regarding the article's sample size and time period [1–4].

In the conclusions, it is important to consider the factor of large companies having a larger market capitalization. Regarding this, whilst many studies have drawn this conclusion, results on the exact sample used in this study give a clearer picture on the discrepancies associated with the utilization of large capital markets. As a result, a regression analysis and analysis of variance were conducted in order to evaluate the link between these factors. Table 4 presents information on this topic for 2020. As always, the data are lagged for one year, so the information for the ESG score is for 2020 whilst the market capitalization is for 2021. Highlighting this time interval allows to analyze the potential effects of COVID-19 on the correlation between CSR and CFP.

**Table 4.** Regression statistics for a sample size of 691 North American companies on the parameters of ESG score and market capitalization for the years 2020 and 2021, respectively.

Regression Statistics					
Regression Coefficient	0.215286807				
Adjusted R Square	0.0449643				
Standard Error	$1.64307  imes 10^{11}$				
Observations	691				

The table above showcases that, in 2020, the effects of CSR on CFP had a large impact, which is evident due to the relatively high regression coefficient value when compared to, for example, Figure 1 or Table 3. These results might imply that this anomaly may be explained by the COVID-19-related pandemic, highlighting the necessity for companies to be sustainable.

The small value of *Significance F* in Table 5 proves that the data utilized in the study are a good fit. Thus, the regression coefficient can be considered. The value of the regression coefficient in Table 4 illustrates that there is a positive relationship between corporation size and ESG performance. As a result, there is an interloped chain similar to the one presented in the figure below.

Table 5. Analysis of variance on companies' ESG score and market capitalization.

	SS	MS	F	Significance F
Regression Residual Total	$\begin{array}{c} 9.04022 \times 10^{23} \\ 1.86009 \times 10^{25} \\ 1.95049 \times 10^{25} \end{array}$	$\begin{array}{l} 9.04022 \times 10^{23} \\ 2.69969 \times 10^{22} \end{array}$	33.48608051	$1.08976 \times 10^{-8}$

The small value of *Significance F* in Table 5 proves that the data utilized in the study are a good fit. Thus, the regression coefficient can be considered. The value of the regression

coefficient in Table 4 illustrates that there is a positive relationship between the corporation size and ESG performance. As a result, there is an interloped chain. The process can be assumed to be similar to the following: a company obtains higher financial stability, which, as a result, leads to the corporation becoming larger. This, in turn, pressures it to be more transparent in terms of CSR reporting and disclosure. Higher ESG score performance potentially leads to higher CFP, again leading to higher financial stability.

These results suggest that the second hypothesis is also proven to be correct. An element of each company that had not been researched in the present study is the peculiarities of industry-specific values and metrics. Studies have illustrated that different sectors of the economy incorporate policies of CSR differently and follow them accordingly as well.

# 5. Conclusions

This study examined an array of companies' success based on the ESG score. The main focus was the analysis of the correlation between a corporation's probability of bankruptcy and CSR ratings using Ohlson's O-score model, whilst most previous articles researched this article predominantly using the Altman Z-score [1–4]. This method entails the novelty of the study—the incorporation of an updated and more complex model of forecasting bankruptcy and comparing the values to the companies' ESG scores. The results of the article are then compared with those achieved utilizing different research methods.

In the Literature Review section, the main problems and topics of discussion related to the relationship between CSR and CFP were examined. The results of past research papers allowed the study to utilize more efficient methods of analysis, as well as contributing to the main points of interest that were analyzed. Amongst these, not only was the financial stability of sustainable companies investigated but also the consequential correlation with the size of the studied companies.

The analysis data featured information on 691 North American companies of different industry sectors for the period from 2011 to 2020. A regression model was implemented in order to establish the presence of the discussed relationship. Moreover, Pearson's correlation analysis was used to provide more concrete proof on the hypotheses proposed in the article.

The results and findings of the study itself provide several contributions to the literature. They correspond to previous literature [1–9]. It was proven once again that the Governance pillar was the most influential aspect of the ESG aggregate, providing by far the largest impact on the consequential financial performance of the company. Its regression coefficient is much higher than other individual pillars and the ESG score as a whole. Furthermore, even though the effect of the Sociological and Environmental pillars is still under mixed review, it can be stated that ESG performance as a whole holds a positive effect on the business's activities. Apart from the company being sustainable in different aspects of life, such as the climate and potentially rural and urban development through different corporate programs, it also establishes a sustainable future for itself in terms of finance. This is explained by the fact that high-ESG-performing companies tend to have a slight edge in CFP, leading to higher financial stability, which makes the corporation larger, in turn increasing the performance of the company in terms of ESG score [5–8].

The analysis itself was conducted accounting for the one-year lag of ESG scores in order to see the consequential effects of sustainable parameters on the company's probability of default. The same was carried out regarding the expanding analysis related to the firms' sizes and their ESG scores.

The article contributes to the body of knowledge of the effects of CSR incorporation on consequential CFP. To be more specific, articles have previously examined the correlation between a company's ESG scores and probability of default [1–6]. However, the methods and economic models used in those studies are different than those presented in this article. Its incorporation of the Ohlson O-score is the underlying novelty of the article. Furthermore, as has been stated, the results of this article with a new research method coincide with previous studies, proving the hypotheses that have been put forward earlier.

As for the limitations in the study: the article does not compensate for a typical nuance in this field—survivorship bias. The article does not include any companies that went bankrupt during the sampled time period. Future studies can try to emphasize and review the performance of these companies in retrospect in order to evaluate whether the reasons for financial failure were in any way related to a company's ESG policies.

Directions for future research could look to expand the article's method, utilizing it not only in North America but also in European countries, the Asian market, and other regions with a high level of CSR disclosure and reporting. Furthermore, research should be carried out with in-depth analysis on industry-specific trends, for example, tendencies in manufacturing companies and those which provide services. This will allow to draw conclusions on the key beneficiaries of high corporate social performance.

**Author Contributions:** Conceptualization, A.K.; methodology, A.G.K.; software, N.F.; validation; formal analysis, T.S.; writing—original draft preparation, A.L.; writing—review and editing, A.L. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data sharing is not applicable to this article.

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

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