

# DOES ESG SCORE HAVE AN IMPACT ON CORPORATE PROFITABILITY AND RISK?<sup>1</sup>

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## **Abstract**

The aim of this study is to analyse if ESG (Environmental, Social and Governance) scores can influence the firm performance and risk. In the current climate, ESG has become increasingly important for businesses and a company with good ESG credentials is one that considers very important the impact of its actions on the environment and society, alongside with good governance practices. Do to the increased interest to sustainability issues, companies are very focused on ESG factors as they can influence their key financial values. Our study shows that ESG combined score is positively and significantly associated with firm value and profitability. These findings can suggest that high ESG performance can be the key to financial return for the firm in terms of both value and profitability. Moreover, our main findings present that ESG combined score can also influence the credit ratings, so firms can invest in ESG to improve their financial risk.

**Keywords:** ESG, Corporate Profitability, Credit ratings

**JEL Classification:** G31, Q56

## **1.INTRODUCTION**

Given the present economic circumstances, it has become increasingly crucial for most organizations to prioritize sustainability. Companies now face a broader array of significant risks and opportunities that are intricately linked to climate change, global health crises, the need for transparent supply chains, and the escalating pollution levels resulting from industrialization in various countries. In response, markets, governments, non-governmental organizations (NGOs), local communities, and other stakeholders are demanding heightened transparency and accountability across the environmental, social, and governance (ESG) spectrum.

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This call for greater awareness aims to comprehensively grasp the genuine impact of business and industry on our environment and communities. The integration of ESG factors into investment decisions and business practices has gained significant traction.

Beyond ethical and responsible investing, there is growing evidence suggesting that companies that have shifted their focus to ESG factors and thus have a greater awareness of sustainability, are able to create new virtuous approaches to business. ESG issues have become a topic of interest also for shareholders, and governments as they reflect a risk management issue, while for companies they have become an integral part of competitive strategy, especially since the Covid-19 pandemic.

The regulatory landscape is also evolving to encourage ESG integration. Governments and regulatory bodies are implementing frameworks and guidelines that promote responsible business practices and require ESG disclosure. This regulatory push, combined with investor demand, is further incentivizing companies to improve their ESG performance and reporting. As the field of sustainable finance continues to develop, further research and analysis are needed to deepen our understanding of the relationship between ESG and financial performance. This includes examining specific industry contexts, regional variations, and the impact of different ESG factors on financial outcomes.

The present study continues with the literature review on the ESG factors that have an impact on corporate profitability and risk. This is followed by the research methodology section, presentation and discussion of the results. Finally, conclusions are drawn and suggestions for future implications and research are provided.

## **2.LITERATURE REVIEW**

Several studies document how ESG affects firm value and profitability. According to a meta-analysis conducted by Friede et al. (2015) stated, researchers began looking for a link between corporate financial success and ESG standards since the 1970s. After reviewing more than 2000 papers, the authors conclude that the research validates the rationale for investing in ESG and that about 90% of studies indicated a favourable relationship between ESG and firm financial performance. Another meta-analysis of 132 papers published in reputable journals reveals that 78% of studies pointed to a positive relation between sustainability and financial performance of the firm (Alshehhi et al., 2018).

This type of analysis delimited three categories of relationships between ESG performance and firm profitability. Velte (2017) found that ESG has a positive effect on firm's value (Tobin's Q) and profitability (Return on Assets -ROA) for a sample of companies from Germany. On the other hand, several multi-country studies report a negative relationship between ESG performance and firm value – profitability.

Nollet et al. (2016) use accounting and market metrics to investigate the connection between social and financial performance of S&P500 companies from 2007 to 2011, obtaining a negative relationship on linear models and a positive relationship on non-linear models. A recent study of Garcia and Orsato (2020) compares emerging and developed countries through a sample of 2165 firms from 2007 to 2014. It was found that in emerging markets the relationship between ESG scores and financial performance is negative.

Another group of researchers conducted studies that revealed a mixed relationship between ESG performance and financial return of the firm. For a sample of Norwegian listed firms between 2010 and 2019, Giannopoulos et al. (2022) examine the impact of ESG scores on financial performance. This study reveals mixed results, indicating a positive relation between ESG scores and firm value (Tobin's Q) and negative relation between ESG scores and profitability (ROA).

The ESG scores can perform as guidelines among the firm's competitors and be reviewed cyclically to provide the market with further indications of the sustainability improvements of the firm. In this regard, De Lucia, Pazienza and Bartlett (2020) conducted a case study of 1038 public companies in Europe and applied a combined analysis with machine learning and logistic regression models. Machine learning models investigated the accuracy of ROE and ROA based on ESG and other economic indicators, while logistic regression models examined whether ESG factors affected the performance of these financial metrics. Main findings suggested that both ROE and ROA would be perfectly predicted by most ML-algorithms and that predictions performed better than the baselines. The added value of the paper is the accuracy of financial indicators such as the expected Return of Equity (ROE) and Return of Assets (ROA) on several ESG and other economic metrics, using a logistic regression model to infer on the relationships between ESG factors and ROE and ROA performances of European enterprises.

Landi and Sciarelli (2019) developed a study using a panel data analysis through a Fixed Effects Model to verify the impact of an ESG Rating on a company's abnormal return. For a sample of Italian firms listed on Financial Times Stock Exchange Milano Indice di Borsa (FTSE MIB) Index, they measured abnormal returns via Fama–French approach, running a yearly Jensen's Performance Index for each company under investigation. The authors found no statistically significant evidence of ESG assessment on Italian Blue Chips' abnormal returns. Additionally, seems that the market investors pay attention anyway to typical risk factors such as EBITDA and financial leverage, implying that the other variables included in the analysis could be considered under control and risk manageable.

Some companies can develop initiatives in one of these three dimensions that contribute to the generation of value, while others can decrease financial value.

Duque-Grisales and Aguilera-Caracuel (2021)'s paper examines E, S and G separately to determine accurately the relationship of each sub-factor to firm's financial performance (FP) in Latin America. Empirical results indicate that ESG scores are negatively associated with firms' financial performance (FP) according to a random effects regression. The negative sign of this association indicates that multilatinas with the best ESG scores tend to be less profitable and this finding could occur because costs related to the implementation of ESG initiatives are not reflected in a company's FP because they are not performed in the correct manner. Another reason may indicate that there is not enough institutional support to render them more visible, thus not ensuring approval from stakeholders. Alternatively, when companies make high investments in ESG, they may sacrifice their cash flow and divert resources required for their operation, resulting in a decrease of their performance.

The ESG literature was enriched with the most recent study of Iazzolino, Bruni, Veltri, Morea & Baldissarro (2023) showing which industries are most sensitive to ESG issues, with focus on different European sectors. By taking a sample of 1979 listed firms belonging to various industrial sectors, they determined the business efficiency value, taking into account both financial and sustainability factors. From the analysis of the gap, calculated as the difference between efficiency with and without ESG, they found that ESGs impact on firm efficiency differs from one sector to another. Furthermore, it was provided empirical evidence for supporting the construction of efficient and sustainable portfolios by mapping sectors in terms of risk-return. This research revealed that methodologies for assessing ESG scores are mainly far from being standardized. Because of this, policy actions are needed to make non-financial disclosure more transparent to investors and, likewise, to provide companies with generalized and explicit guidance for non-financial (i.e., ESG) reporting.

### **3.DATABASE AND METHODOLOGY**

The aim of our study is to analyse if ESG (Environmental, Social and Governance) scores can influence the firm's performance and risk. The study focuses on companies from EU-27 countries because, according to the recent Directive of the European Commission, all listed companies have to disclose information on what they see as the risks and opportunities arising from social and environmental issues and also on the impact of their activities on people and environment.

Our database consists of 677 companies from both advanced and emerging economies from EU-27, acting in several industries - Oil, Gas & Consumable Fuels, Automobiles, Chemicals, Metals & Mining, Food Products, Tobacco, Building

Products, etc. We used Reuters Eikon database that contains financial information. Table 1 shows the ESG scores grades for our sample computed for 2022 year.

**Table 1. ESG scores grades**

ESG Score Grade	No of companies
A+	9
A	84
A-	152
B+	118
B	110
B-	86
C+	57
C	25
C-	18
D+	13
D	5
<b>Total</b>	<b>677</b>

*Source: Authors' analysis*

For ESG scores, the database was also formed using Refinitiv Eikon platform. Please see Table 2 for ESG descriptive statistics recorded for companies analysed. The database contains environmental, social, and governance scores of publicly traded companies.

**Table 2. ESG descriptive statistics**

	Average	Median	StDev	Min	Max
<b>ESG Score</b>	65,67	68,38	16,80	11,92	93,92
<b>Environmental Pillar Score</b>	62,34	65,72	22,50	0,00	99,24
<b>Social Pillar Score</b>	67,66	72,19	19,76	6,08	97,33
<b>Governance Pillar Score</b>	66,28	69,20	17,84	10,58	96,81

*Source: Authors' analysis*

According to the ESG descriptive statistics, for environmental pillar the minimum score was registered for 5 companies, corresponding to industries such as Hotels, Restaurants & Leisure, Trading or Machinery. On the opposite, in the Household Durables industry it has been recorded the highest score. From a social point of view, the ESG score in this area varied from 6,08 in the machinery industry to 97,33 for Textiles, Apparel & Luxury Goods industry.

Apart from the social and environmental components, in terms of governance the leading role is of the chemicals industry, whereas the lowest registered score was in the professional service area.

**Table 3. Credit ratings and rating scores**

<b>Rating</b>	<b>Score</b>
AAA	24
AA+	23
AA	22
AA-	21
A+	20
A	19
A-	18
BBB+	17
BBB	16
BBB-	15
BB+	14
BB	13
BB-	12
B+	11
B	10
B-	9
CCC+	8
CCC	7
CCC-	6
CC+	5
CC	4
CC-	3
C	2
D	1

*Source: Authors' analysis*

For the preliminary regression analysis, eight OLS regression models were constructed: four regressions for the profitability variable (i.e., Return on Assets, ROA) and four regressions for the credit risk variable (i.e., credit rating). Furthermore, the sample dataset was categorized by asset size and total ESG score for further analysis.

The main reason for this in-depth analysis process is to identify potential patterns in the sample dataset while gaining a better understanding of the ESG and corporate

financial performance relationship in specific settings. The explanatory variables are presented in Table 4.

**Table 4. Explanatory variables**

Symbol	Variable	Explanation
<b>Dependent variables</b>		
ROA	Return on assets	Profitability ratio that provides how much profit a company can generate from its assets
Credit score	Credit Combined Implied Rating Scores	Agency-equivalent credit rating implied by the current estimated forward 1-year default probability from the StarMine Combined Credit Risk Model
<b>ESG scores</b>		
ESG SCORE	ESG Score	Overall company score based on the self-reported information in the environmental, social and corporate governance pillars
ESG_ENV	Environmental Pillar Score	Measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value.
ESG_SOC	Social Pillar Score	A company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.
ESG_GOV	Governance Pillar Score	Measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks

and balances in order to generate long term shareholder value.

<b>Explanatory variables</b>		
EV/EBITDA	Enterprise Value to EBITDA	This ratio measures how much a company is valued per each dollar of EBITDA.
EBITDA MARGIN	EBITDA Margin	Measure of a company's operating profit, shown as a percentage of its revenue
D/E	Total Debt to Total Equity (%)	(D/E) ratio is used to evaluate a company's financial leverage and is calculated by dividing a company's total liabilities by its shareholder equity
C_RATIO	Current Ratio	Measures a company's ability to pay its short-term liabilities using its short-term assets
LN_TOTAL ASSETS	ln(Total Assets)	Firm's size calculated by the logarithm value of the total assets in units as a proxy for company size.
INTEREST_COV_RATIO	Interest Coverage Ratio	This is a debt and profitability ratio used to determine how easily a company can pay interest on its outstanding debt

*Source: Authors' compilation*

The descriptive statistics for the variables used in the models are presented below in Table 5.

**Table 5. Descriptive statistics**

	<b>Average</b>	<b>Median</b>	<b>StDev</b>	<b>Min</b>	<b>Max</b>
ESG Score	65.67	68.38	16.80	11.92	93.92
Environmental Pillar Score	62.34	65.72	22.50	0.00	99.24
Social Pillar Score	67.66	72.19	19.76	6.08	97.33
Governance Pillar Score	66.28	69.20	17.84	10.58	96.81
Enterprise Value to EBITDA	11.06	7.89	17.26	0.43	226.60
EBITDA Margin	0.18	0.15	0.12	-0.03	0.90
Total Debt to Total Equity, Percent	1.11	0.67	1.69	0.00	19.54
Current Ratio	1.55	1.34	0.88	0.28	9.23
ln(Total Assets, Reported)	22.29	22.24	1.66	18.32	27.06
Interest Coverage Ratio	37.91	11.92	119.91	-9.79	1541.59

*Source: Authos' calculations based on Eurostat*

We have also tested for identifying multi-collinearity. The correlation matrix for this dataset is presented in Table 6. We did not consider the variables correlated at a higher level than 0.4 in the same regression. This approach is based on the fact that otherwise bias coefficients of the independent variables can be obtained in the regression models upon which the research was conducted.

**Table 6. Correlation matrix**

	ESG scores	ESG_ENV	ESG_SOC	ESG_GOV	EV/EBITDA	EBITDA MARGIN	D/E	C_RATIO	LN_TOTAL ASSETS	INTEREST_COV_RATIO
ESG scores	1,00									
ESG_ENV	0,87	1,00								
ESG_SOC	0,91	0,73	1,00							
ESG_GOV	0,66	0,38	0,43	1,00						
EV/EBITDA	-0,04	-0,02	-0,05	-0,04	1,00					
EBITDA MARGIN	0,02	-0,03	0,03	0,05	-0,15	1,00				
D/E	0,06	0,06	0,05	0,01	0,02	0,02	1,00			
C_RATIO	-0,12	-0,11	-0,12	-0,04	-0,04	0,17	-0,26	1,00		
LN_TOTAL ASSETS	0,59	0,55	0,53	0,34	0,00	0,07	0,06	-0,15	1,00	
INTEREST_COV_RATIO	-0,05	-0,04	-0,04	-0,03	-0,02	0,06	-0,13	0,22	-0,01	1,00

*Source: Authos' calculations*

## RESULTS

In this section we tested the impact that financial performance, through the measure of ROA, and the credit combined implied rating scores have on ESG components such as governance score, social score or environment score. Moreover, we included in this model variables explanatory variables including EV/EBITDA, Total Debt/Total Equity, ln (Total assets), current ratio in order to obtain an overview regarding future directions and possible impact on the profitability of the firm. The results are presented in Table 7 and Table 8. We used a OLS regression model to highlight whether financial performance or credit risk can be influenced by several factors. We did not consider in the same regression the variables correlated at a higher level than 0.4, t-statistics are in parentheses. The symbols \*, \*\*, \*\*\* represent significance levels of 10%, 5% and 1%.

Table 7 shows the result of the regression analysed using financial performance (ROA) as a dependent variable. Overall, models indicated a positive influence on global ESG score and only ESG sub-factors - environmental (E) and social (S).

**Table 7. The model estimated results for financial performance (ROA)**

Variable	(1)	(2)	(3)	(4)
ESG scores	<b>0.0004*</b> (1.80)			
ESG_GOV		0.0001 (0.79)		
ESG_SOC			<b>0.0002*</b> (1.81)	
ESG_ENV				<b>0.0003**</b> (2.03)
EV/EBITDA	<b>-0.0006**</b> (-2.55)	<b>-0.0006***</b> (-2.60)	<b>-0.0006***</b> (-4.26)	<b>-0.0006***</b> (-2.65)
EBITDA MARGIN	<b>0.1559***</b> (5.97)	<b>0.1543***</b> (5.87)	<b>0.1548***</b> (7.50)	<b>0.1587***</b> (6.01)
D/E	<b>-0.0076***</b> (-4.73)	<b>-0.0076</b> (-4.6)	<b>-0.0076***</b> (-4.96)	<b>-0.0077***</b> (-4.77)
C_RATIO	<b>0.0086**</b> (2.54)	<b>0.0084**</b> (2.48)	<b>0.0087***</b> (2.84)	<b>0.0084**</b> (2.46)
LN_TOTAL ASSETS	<b>-0.0053**</b> (-2.42)	<b>-0.0033*</b> (-1.94)	<b>-0.0046***</b> (-2.59)	<b>-0.0053***</b> (-2.62)
INTEREST_COV_RATIO	<b>6.48E-05**</b> (2.34)	<b>6.34E-05**</b> (2.31)	<b>6.39E-05***</b> (2.98)	<b>6.44E-05**</b> (2.33)
R-squared	20.48%	11.29%	20.28%	20.56%
Number of observations	677	677	677	677

*Source: Author's calculations*

The total ESG factor variable is economically and statistically significant. This supplements the literature findings of the positive relationship between ESG and performance. As Li et al. (2018) argued, there is a strong relation between the level of ESG reporting and firm value, indicating that stakeholders and investors trust and accountability have a positive influence on firm value. According to our results the environmental (E) and social (S) component have a positive influence on firm

performance, so we can conclude that companies that pursue the protection of the environment and have social programmes for local communities will record a higher return. The Governance component is not significant so this component can not influence the total assets performance.

The control variables that we considered show that ROA is positively influenced by EBITDA margin, interest cover ratio and current ratio. This confirms the literature as higher profits in terms of EBITDA means a better utilization of assets and also firms with lower risk (both on the long term and short term) provide a better performance ratio. Also, our study shows that, in 2022, in the industries analysed that have a higher company size tend to have lower ROA, and also a higher D/E ratio will to the same result. It is surprising that a higher EV/EBITDA will also influence negatively the ROA, but this can be explained that as the company is more attractive in the market, this is not a key for an increase in ROA.

We have conducted a further analysis by studying the influence between the three components of ESG and firm credit rating. Table 8 shows the results of the four regressions conducted using the credit risk variable (i.e., credit rating).

**Table 8. The model estimated results for credit risk**

Variable	(1)	(2)	(3)	(4)
ESG score	<b>0.0029*</b> (2.78)			
ESG GOV		0.0070 (1.02)		
ESG SOC			<b>0.0248***</b> (3.07)	
ESG ENV				<b>0.0200***</b> (2.78)
EV/EBITDA	-0.0011 (-0,17)	-0.0021 (-0,24)	-0.0010 (-0,32)	-0.0016 (-0,16)
EBITDA MARGIN	<b>2.7344***</b> (2.84)	<b>2.6228***</b> (2.72)	<b>2.6571***</b> (2.80)	<b>2.8965***</b> (2.97)
D/E	<b>-0.6329***</b> (-5.35)	<b>-0.6281***</b> (-5.13)	<b>-0.6303***</b> (-5.31)	<b>-0.6369***</b> (-5.39)
C_RATIO	<b>0.2535**</b>	<b>0.2394*</b>	<b>0.2605**</b>	<b>0.2407*</b>

	<b>(2.05)</b>	<b>(1.93)</b>	<b>(2.10)</b>	<b>(1.95)</b>
LN_TOTAL ASSETS	-0.0163 (-0,25)	<b>0.1346**</b> <b>(2.09)</b>	0.0064 (0,14)	0.0096 (0,10)
INTEREST_COV_RATIO	<b>0.0038***</b> (2.78)	<b>0.0037***</b> (2.78)	<b>0.0037***</b> (2.78)	<b>0.0037***</b> (2.81)
R-squared	0.2464	0.2281	0.2479	0.2438
Number of observations	677	677	677	677

*Source: Author's calculations*

Also, in this case, the total ESG variable is economically and statistically significant. This means that banks score cards are giving better scores for companies that are looking closely to their ESG policies. The social and environmental component are positively influencing credit ratings, while governance component is not significant. This means that, present bank policies are more focused on green and environments friendly companies, and entities with CSR programmes implemented. Governance is, for the moment, not so important.

The control variables that we considered show that credit risk is positively influenced by EBITDA margin, interest cover ratio and current ratio, because, according to our classification, the higher the credit risk number, the better credit rating is. This confirms the literature as higher profits in terms of EBITDA leads to a better credit risk rating and also, firms with lower risk ratios (both on the long term and short term) provide better possibilities for bank to borrow. Also, our study shows that, in 2022, in the industries analysed that have a higher company size tend to have better bank score, and also, as we expected, a higher D/E ratio will lead to a higher credit risk.

## CONCLUSIONS

Integrating ESG criteria into business decisions capital allocation by large institutional investors is a dominant theme in the global capital markets in recent years. Thus, investors are increasingly considering non-financial criteria, such as the impact of environmental impact of companies' activities, the relationship with employees, suppliers and other stakeholders, or implementation of the highest standards of corporate governance in the analysis of companies in their investment universe.

From a managerial point of view, several studies suggest that managers and CEOs should pay more attention to ESG components as a monetary tool that should both form an integral part of a firm's strategy and contribute to targeted issues in the

societies in which they operate. Moreover, managers should consider ESG as an investment, not an expense.

Increasing awareness of ESG is necessary, with the belief that the financial system can play a pivotal role in driving the transition towards a more sustainable economy. As our results show, also companies with better ESG policies will record an increase in performance and credit risk ratings.

Subsequent research could utilize this policy review to evaluate the effectiveness of European policies in aligning with ESG principles. Additionally, expanding the scope of analysis to incorporate the regulatory frameworks of countries outside the EU could offer valuable insights and contribute to the ongoing discussion.

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