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Short-Term Costs and Long-Term Benefits of Environmental, Social, and Governance Performance on Corporate Credit Ratings

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ABSTRACT

ESG (Environmental, Social and Corporate Governance) criteria are becoming increasingly important for companies to activate risk management and create long-term value within the framework of issues such as environmental concerns, expectations, reporting obligations, circular economy, regulatory compliance and investment demands. This study aims to explain how ESG scores and a company's financial performance affect credit risk. A company's ESG performance plays an important role in determining its credit score, which is directly reflected in its financial success and risk profile, and in strategic decision-making processes for investors and policy makers. The study determined that the balance between ESG performance and credit scores should be well understood, especially that high ESG scores may not always mean low financial risk, and that the long-term benefits of ESG investments should be well understood, as they will increase short-term costs.

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Introduction

The concept of economic sustainability was first discussed by the famous economist A. Pigou in his works published in 1912 and 1920. Rather than a fixed concept, sustainability has a dynamic structure to meet the needs of current and future generations by considering past and future resource imbalances (Şen, Kaya and Alpaslan, 2018: 8). Founded in 1968 and known as a think tank, the Club of Rome, in its report titled "Limits to Growth" published in 1972, emphasized the threats to the global society and the dangers awaiting future generations in the 21st century. The report stated that humanity could continue its existence in a sustainable manner if effective population planning and global economic balance were ensured. However, it was explained in detail that uncontrolled population growth and economic expansion would rapidly deplete the world's resources, making it difficult to meet the needs of future generations. The growing interest in sustainability and responsibility is directly related to the depletion of resources that have been undervalued in the past and the realization of the inadequacy of previous practices (Hoellermann, 2020: 5). The transition from fossil fuels to renewable energy, waste management, plastic pollution in the oceans, recycling, equality, diversity (Hoellermann, 2020: 1), climate change, population growth, urbanization and economic inequalities are among the key issues that need to be addressed on a global scale (Falch, 2016: 9). In today's rapidly changing world, dynamics such as demographic transformations, migration, globalization and digitalization are profoundly affecting the economy and society. The impacts of intensifying climate change, environmental degradation and biodiversity loss make it inevitable for companies to engage in long-term strategic planning (Nițescu and Cristea, 2020: 693).

Sustainable finance is an approach to integrating environmental, social and governance (ESG) principles into decision-making processes, economic growth and investment strategies. This approach, which has become increasingly important for both borrowers and lenders, encourages investors to favor companies that are financially profitable and support social sustainability (Ramic, 2019: 9). Investors consider social and environmental sustainability in their investment decisions and incorporate this understanding into their business processes (Nizam et al., 2019: 36). Companies are also making increasing efforts to offer more sustainable products for consumers.

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Many studies reveal that businesses that prioritize ESG criteria, adopt sustainable practices, and share information with the public in accordance with the principle of openness provide more advantages in the long run despite the increase in openness and operational costs (Akbaş and Canikli, 2019).

The main purpose of the financial system is to facilitate decision-making processes and ensure the efficient allocation of capital. Rating, also known as a type of grading process, aims to analyze the capacity of companies, governments and organizations to fulfill their financial obligations on time through various data and comprehensive assessments. While this process plays an important role in decision-making mechanisms, credit ratings provide critical information about countries and businesses to organizations, investors and financial intermediaries in capital markets. The rating system also functions as a risk assessment and management tool, contributing to the anticipation of future uncertainties and supporting sustainable business models by promoting good governance (Levine, 2005: 3).

Literature Review

This research examines the impact of ESG performance on companies' credit ratings. While ESG investments contribute to the long-term value creation of companies, they can also increase costs and affect credit risks in the short term. This situation creates a significant source of uncertainty for investors and credit rating agencies. This study, which was conducted using the dynamic panel data analysis method, evaluates the impacts of ESG criteria on credit risk within the framework of sectoral differences and macroeconomic conditions, and offers a new perspective to the literature and makes significant contributions to existing research.

In today's highly competitive global environment, organizations are increasingly placing more emphasis not only on their economic performance and profit-oriented approach, but also on their environmental, social and corporate governance performance. This change stems from society's expectations from companies and the business world to support human rights, be sensitive to environmental and climate change issues, support animal rights, combat corruption, gender equality, comply with the law and maintain accountability and transparency in all their activities. As public awareness of these issues increases, the quality of products and services and the commitment of manufacturing organizations to social responsibility initiatives have begun to significantly affect the perception of stakeholders, especially customers and investors, towards the organization.

ESG scores are a system that rates companies according to three main categories. The first category focuses on environmental issues such as environmental impact, resource consumption, biodiversity and waste management. The second category evaluates social issues, including impact on society and suppliers, working conditions and other social impacts. The third category examines governance issues such as transparency, shareholder relations, executive compensation, and board diversity (Ribando and Bonne, 2010:10). Although ESG investing is a complex and relatively new concept that companies worldwide have difficulty fully incorporating into their business strategies due to limited knowledge on the subject, individual investors now place greater emphasis on the sustainability of companies and include ESG criteria in their investment decisions by considering the risk assessment of their investments (Yoshino, Taghizadeh-Hesary and Otsuka, 2020:96-97). Similarly, global investors consider ESG-related agreements during feasibility studies conducted before making investment decisions (Mehar, 2020:137-138).

Credit rating encompasses not only the assessment of an institution's ability to meet its obligations on time, but also the measurement of the risk associated with granting credit to a business or individual. Rating activities involve the assessment of the rated value and related risk factors using historical data and a specific model.

Ratings can be classified as long-term or short-term depending on maturity. Long-term ratings are for a period longer than one year, considering the basic conditions and financial characteristics of the sector and economy, and include the company's performance, technological developments, changes in demand and changes in legislation. Short-term ratings, on the other hand, cover a period of one year, and express the company's ability to fulfill all obligations and its capacity to obtain liquidity and capital resources. Credit ratings also vary by sector. Growth and financing opportunities can have a direct impact on credit ratings, growth strategies and financing opportunities for companies in the technology and industry sectors. Since technology companies need external financing for their research and development activities, high credit ratings allow these companies to borrow at advantageous terms. In the industry sector, high credit ratings play a critical role in financing capital expenditure and increasing resilience against economic fluctuations. Credit ratings have a major impact on financing costs and the management of risks in capital markets for both countries and companies.

Credit rating agencies and financial analysts increasingly use companies' ESG performance in their credit risk assessments. This integration is based on the understanding that factors such as environmental risks, social responsibility and governance quality can have significant effects on a company's financial soundness and credit risk. Existing literature reviews show that ESG scores can have a bidirectional effect. While companies with high ESG levels create a negative impact in some countries due to both perception and increased costs, we can also observe the opposite in some studies. A study by Scholz, Roland and Georg (2010) examined the difficulties of integrating sustainability criteria into credit risk assessments.

A comprehensive meta-analysis by Friede, Busch and Bassen (2015) revealed that ESG investments can be costly in the short term. This study examined more than 2000 empirical studies and showed that compliance with ESG criteria can create additional costs in the short term. For example, investments in environmentally friendly technologies, energy efficient equipment or ESG-focused initiatives such as improving labor conditions may negatively affect the financial performance of companies in the short term. This may affect the cash flow and profitability of companies, lowering their creditworthiness and thus negatively affecting their credit ratings. A long-term study by Eccles, Ioannou and Serafeim (2014) found that companies with high ESG performance exhibit better

financial performance in the long term, but these investments may be costly in the short term. This study examined 180 companies over an 18-year period and found that companies with high sustainability practices exhibited better stock performance and profitability in the long term, but these benefits emerged over time. This finding suggests that the long-term benefits of ESG investments may not be sufficiently considered in current credit rating methodologies.

Fatemi, Fooladi and Tehranian (2015) stated that ESG performance may increase companies' costs and negatively affect their financial results in the short term. This study examined the impact of ESG activities on firm value. It has been shown that financing ESG investments may require additional debt, and that increasing the debt/equity ratio of companies may increase financial risks and, as a result, lead to a decrease in credit ratings.

A study by Chava (2014) has shown that companies with environmental concerns are exposed to higher capital costs. This supports the idea that companies focusing on ESG issues may be subject to greater regulatory scrutiny and that this increased oversight may increase risk perception in the short term. There may be inconsistencies between the methodology for calculating ESG scores and credit rating processes. A study by Dorfleitner, Halbritter, and Nguyen (2015) has revealed that there are significant methodological differences even among different ESG rating agencies. This may result in ESG performance not being fully reflected in credit risk assessments.

Companies that comply with ESG (Environmental, Social and Governance) criteria can strengthen their operational stability in the long term by managing environmental and social risks more effectively. Berg, Kölbel and Rigobon's 2022 study revealed that companies with high ESG scores generally have lower credit risk. In addition, strong governance mechanisms enable companies to make healthier decisions by adhering to the principles of transparency and accountability. Compliance with ESG policies is considered as an indicator of lower risk by both investors and credit rating agencies (Giese et al., 2019).

Our study addresses the negative impact of ESG scores on credit ratings and highlights the challenges of incorporating ESG factors into credit risk analyses. The fact that ESG scores are obtained from different sources constitutes an important variable in terms of their effects on credit ratings. Considering the sectoral differences, it was observed that the ESG scores of companies in the finance and technology sectors were positively reflected in their credit ratings. However, it was determined that in the energy and industry sectors, the short-term costs associated with ESG practices were more severe and therefore their effect on credit ratings was limited (Giese et al., 2019). These findings show that ESG factors have different effects on a sectoral basis and these differences should be taken into account in the evaluation processes.

Empirical Findings

ESG scores have become an important component of financial markets, especially for investors. The study was conducted by considering the impact of sustainability scores on companies' credit ratings, financial performance indicators and macroeconomic variables. This study covers the data of 520 companies from 16 different countries and 7 different sectors between 2014 and 2022. ESG scores (environmental, social and governance scores), companies' credit ratings, financial performance indicators (leverage ratio, pre-tax return on assets, Tobin's Q ratio) and macroeconomic variables (GDP per capita, inflation rates) are analyzed.

Variables used in the study:
Credit Score (CR): Credit scores are an important indicator that evaluates the credit risk of companies and shows their financial health. In the study, credit risks on the relevant dates were examined, converted into credit scores and companies were used as dependent variables.
Environmental Score (ES): A measure that evaluates the environmental sustainability practices of companies. It includes environmental factors such as energy efficiency, waste management and carbon emissions.
Social Responsibility Score (SS): A measure that evaluates the social responsibility performance of companies. It includes social factors such as employee rights, job security, social contributions and customer relations.
Governance Score (GS): A measure that evaluates the corporate governance quality of companies. It includes governance factors such as board structure, internal audit mechanisms and shareholder rights.
Leverage (LEV): Indicates the level of debt of the company and is calculated as the ratio of total debts to total assets.
Pre-ROA (PROA): Indicates how effectively the company's assets are used and is calculated as the ratio of pre-period net profit to total assets.
Tobin's Q Ratio (TOBQ): It shows the ratio between the market value of the company and its replacement cost and measures the relationship between the market value of the company and the cost of rebuilding assets.
GDP Per Capita (GDPP): It shows the economic welfare level of the country.
Inflation (INF): It shows the change in price levels in the country over time.
GDP Deflator (GDPD): It shows the change in general price levels in the country. It is calculated as the gross domestic product deflator.
CFY: It shows the share of fixed capital investments in the country in total GDP and is used to measure the effects of the investment rate on economic growth.

In the study, the sector dummy variable is also included in the model to determine whether ESG performance and credit ratings vary with sectoral differences.

Considering the ever-changing nature of ESG scores and credit ratings, instead of fixed effects, random effects or ordinary least squares (OLS) methods, a dynamic panel data model should be used for a more comprehensive analysis. Dynamic panel data models provide more accurate and meaningful results by considering the past values of the dependent variable and the lagged effects of the independent variables.

In this context, the Arellano-Bover/Blundell-Bond model is widely preferred as a Generalized Method of Moments (GMM)-based estimation technique, especially in panel data analyses involving lagged dependent variables. The model is designed to eliminate endogeneity problems. It produces consistent and reliable estimates by using the past values of the internal variables as instrumental variables. At the same time, it minimizes the autocorrelation problem by including the lagged values of the dependent variable as an independent variable.

While ESG investments reduce companies' credit risks in the long term, they may create costs in the short term. This situation may lead to a potential endogeneity problem due to the feedback effect. The Arellano-Bover/Blundell-Bond model uses appropriate instrumental variables to solve the endogeneity problem. It has been observed that there is a high correlation between the past values of ESG performance and credit ratings and their current values. Therefore, the previous period values of credit ratings are used as instrumental variables in the model.

To evaluate the validity of the model, the Sargan and Hansen J tests were applied to test the suitability of the instrumental variables. In addition, the autocorrelation problem was checked with the Arellano-Bond AR(1) and AR(2) tests. In order to take into account, the fixed factors at the company level, sectoral and macroeconomic variables (e.g., country-based GDP and inflation rates) were included in the model. In addition, the environmental (ES), social (SS) and governance (GS) scores, which are the sub-components of ESG, were tested as independent variables in different regression models, and the effects of different aspects of ESG criteria on credit ratings were analyzed.

Descriptive statistics of financial ratios, sustainability data and macroeconomic data of 520 companies between 2014 and 2022. Table 1 is given. The countries in which the 520 companies operate are listed in Appendix 1, and the sectors in which they operate are listed in Appendix 2. These tables show the geographical and sectoral diversity of the data set. It explains that the findings obtained because of the research are not specific to a particular sector or region.

Table 1: Descriptive Statistics

	CR	**ESG**	**ES**	**SS**	**GS**	**LEV**	**PROA**	**TOBQ**	**GDPP**	**INF**	**GDPD**	**CRP**
n	4680	4680	4680	4680	4680	4680	4680	4680	4680	4680	4680	4680
mean	0.721	55.903	55.700	56.510	54.349	0.240	0.094	2.553	53218.134	0.021	0.021	0.240
std	0.130	19.925	21.502	23.989	27.016	0.149	0.067	6.066	20350.795	0.020	0.022	0.052
min	0.150	1.604	0.249	0.258	0.125	0.000	0.000	0.166	6103.241	-0.011	-0.024	0.146
max	1.000	93.990	98.201	98.118	98.546	0.811	0.704	168.234	132468.930	0.093	0.135	0.439

According to Table 1, the average ESG score is 55.90, the highest score achieved during this period is 93.99 and the lowest score is 1.60. This is approximately the same for ES, SS and GS scores.

When the correlation coefficients between the variables are analyzed, it is seen that there are strong positive correlations between the ESG score and its subcomponents Governance Score (GS), Social Score (SS) and Environmental Score (ES). This is a natural result for these subcomponents of the ESG score. When the multicollinearity between the variables is analyzed, it is determined that the ESG score, and its subcomponents should not be used in the same model. The same applies to inflation and GDP Deflator (GDPD). The relationship between credit rating (CR) variables and the variables is analyzed with two different models in Table 2. In Model 1, the ESG score is analyzed alone to determine its overall effect, while in Model 2, the separate effects of environmental, social and governance scores (ES, SS, GS), which are subcomponents of the ESG score, are evaluated separately. In the models, all variables were used in the first stage, and then the estimation was finalized one by one, starting with the most insignificant variable.

Table 2: Model 1 - Model 2

Variable	Model 1			Model 2		
	Coefficient	Std. Error		Coefficient	Std. Error	
CR(-1)	- 0.0497	0.0250	**	- 0.0496	0.0250	**
ESG	- 0.0014	0.0000	***			
LEV	- 0.4613	0.0430	***	- 0.4628	0.0430	***
GDPP	0.0005	0.0000	***	0.0010	0.0000	***
INF	- 0.3965	0.1080	***	- 0.4079	0.1080	***
CFY	0.4814	0.2290	**	0.4797	0.2260	**
PROA	0.7957	0.0600	***	0.7990	0.0600	***
TOBQ	0.0015	0.0010	*	0.0016	0.0010	*
ES				- 0.0004	0.0000	*
SS				- 0.0004	0.0000	*
GS				- 0.0005	0.0000	***
c	0.4916	0.0850	***	0.4917	0.0840	***
Wald statistics		478.2700	***	Wald statistics	485.9900	***

Note: ***, ** and * indicate significance at statistical levels of 1 %, 5% and 10%, respectively.

When Table 2 is analyzed, it is found that ESG score in Model 1 has a negative effect on credit rating, and similarly, ES, SS, and GS scores, which constitute the ESG score in Model 2, have a negative effect on credit rating at approximately the same level. It is observed that PROA is the variable that has the highest increasing effect on credit rating, followed by CFY and TOBQ, which indicate the share of fixed capital investments in total GDP.

In Table 3, different sectors are analyzed with ESG score in Model 3 and different sectors are analyzed with sub-divisions of ESG in Model 4. Among 7 different sectors, the statistically significant sector is seen in the models in Table 3.

Table 3: Model 3 – Model 4

Variable	Model 3			Model 4		
	Coefficient	Std. Error		Coefficient	Std. Error	
CR(-1)	- 0.0981	0.0232	***	- 0.0963	0.0230	***
ESG	- 0.0011	0.0002	***			
LEV	- 0.4370	0.0418	***	- 0.4438	0.0420	***
CFY	0.4408	0.2382	*	0.4384	0.2360	*
PROA	0.8222	0.0574	***	0.8241	0.0580	***
TOBQ	0.0014	0.0008	*	0.0016	0.0010	*
ES				- 0.0004	0.0007	**
SS				- 0.0004	0.0006	*
END	0.0841	0.0435	**	0.0840	0.0430	**
c	0.7559		***	0.7394	0.0570	***
Wald statistics		430.5400	***	Wald statistics	424.9700	***

Note: ***, ** and * indicate significance at statistical levels of 1 %, 5% and 10%, respectively.

In both Model 3 and Model 4, it is found that a company's being in the industrial sector has a positive effect on credit ratings. The ESG score in Model 3 has a negative effect on credit rating, and similarly, in Model 4, ES, SS, and GS scores that make up the ESG score, the GS score is statistically insignificant, while the others have a negative effect on credit rating at approximately the same level. It is observed that PROA is the variable that has the highest increasing effect on credit rating, followed by CFY and TOBQ, respectively.

Moreover, past credit ratings have a negative effect on future credit ratings in all four models analyzed. This effect is due to various factors such as the stickiness of credit ratings, reputational concerns of credit rating agencies, procyclicality, herd behavior and excessive conservatism. These findings suggest that credit rating processes should be made more objective and more responsive to current economic conditions.

Conclusion

In recent years, studies on ESG have been increasing day by day. This situation reflects the increasing awareness of investors and market participants about the relationship between sustainability performance and financial soundness and risk management. This study was conducted to determine the impact of ESG performance, especially on financial indicators such as credit scores. The study found that ESG scores negatively affect credit scores. This situation shows that sustainability investments can create financial costs in the short term and these costs can be negatively reflected in companies' credit scores. For example, the meta-analysis conducted by Friede, Busch, and Bassen (2015) indicates that ESG investments can be costly in the short term. Similarly, Eccles, Ioannou, and Serafeim (2014) also show that high ESG performance provides positive financial effects in the long term, but costs can negatively affect credit scores in the short term. When the leverage ratio, one of the financial performance indicators, is examined, it is found that high leverage ratio increases companies' debt burden and negatively affects credit scores. Myers (2001) and Graham (2000) emphasize the negative effects of high debt ratios on the financial health of companies. It has been found that pre-tax active profitability positively affects credit ratings. The same situation has emerged in the studies of Lang, Ofek and Stulz (1996), who state that companies with high profitability have lower financial risk, and this positively affects the credit ratings of companies. It has been determined that Tobin's Q ratio reflects the investment opportunities and growth potential of companies, and this positively affects the credit ratings. It has been determined that the effects of the investment ratio on economic growth in the country are positive.

Among the reasons for the positive effects are that companies operating in technology sectors have innovation and high growth potential and therefore behave differently than other sectors on credit ratings. Credit rating processes play a critical role in the functioning of financial markets. Examining the effect of past credit ratings on future ratings is especially important in terms of understanding the behavior of credit rating agencies, market dynamics and economic cycles. There are various studies examining the effect of past credit ratings on future evaluations. Alsakka and ap Gwilym (2010) observed the "stickiness" effect in credit ratings in their study titled "Leads and lags in sovereign credit ratings". The researchers found that past ratings can negatively affect future ratings and that especially downgraded ratings are not rapidly upgraded even when economic conditions improve. Bannier and Hirsch (2010) put forward the concept of "reputational capital" in their study and showed that credit rating agencies can be overly cautious in their future assessments to compensate for their past mistakes. Kiff et al. (2012) examined the cyclicality in credit rating processes in their study and showed that past ratings can lead to excessive corrections in future assessments. This cyclicality manifests itself in the form of high ratings given during economic expansion periods, turning into extremely low ratings during contraction periods. This finding supports the negative effect of past credit ratings on today's credit ratings.

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Appendix

Appendix 1: Distribution of Companies by Country

Country	Number of Companies	Percentage (%)
USA	150	28.80%
Germany	60	11.50%
United Kingdom	55	10.60%
France	50	9.60%
Japan	45	8.70%
China	40	7.70%
Other Countries	120	23.10%
Total	520	100%

Appendix 2: Distribution of Companies by Sector

Sector	Number of Companies	Percentage (%)
Finance	120	23.10%
Technology	90	17.30%
Energy	80	15.40%
Industry	70	13.50%
Healthcare	60	11.50%
Consumer Goods	55	10.60%
Other	45	8.70%
Total	520	100%

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