RESEARCH ARTICLE

ESG Ratings, Scope Emissions, and Corporate Creditworthiness: Insights into Rating Divergence in the U.S. and EU

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Abstract – This study explores the relationship between corporate credit ratings, Environmental, Social, and Governance (ESG) ratings, and Scope 1, 2, and 3 emissions for the largest 100 publicly traded companies by market capitalization in the U.S. and the EU. By integrating credit ratings from Moody's and S&P Global, ESG ratings from Refinitiv and S&P Global, and emissions data from corporate sustainability reports, this research addresses the inconsistencies in how emissions transparency impacts creditworthiness. Employing statistical analyses such as correlation, regression, and quartile comparisons, the study provides novel insights into the weak association between ESG ratings and actual emissions performance. The findings reveal that higher credit-rated companies tend to report higher Scope 1 and 2 emissions, while ESG ratings, despite being seen as indicators of sustainability, fail to consistently reflect a company's emissions data, particularly Scope 3 emissions. This study contributes to the literature by underlining the methodological divergences among ESG rating agencies, emphasizing their limited alignment with environmental performance metrics. Highlighting the need for a standardized ESG reporting framework, this paper calls attention to the limitations of current ESG scores as a proxy for corporate sustainability and their implications for credit rating assessments.

1. INTRODUCTION

Environmental, Social, and Governance (ESG) ratings have gained recent interest as a proxy for corporate sustainability. However, there is considerable disagreement among ESG rating agencies regarding the reliability of the metrics, particularly on Scope 1, 2, and 3 emissions. Scope emissions are greenhouse gases produced by operations directly (Scope 1), indirectly through purchased electricity (Scope 2), and by value chains (Scope 3). The literature highlights significant discrepancies in how ESG ratings account for and report emissions, leading to widespread disagreement among rating agencies. The divergence in ESG ratings across rating agencies is well-documented. Indeed, several studies have made the remarkable finding that because of the differences in scope, measurement, and weighting approaches, different agencies routinely reach starkly conflicting estimates over the same companies (Berg et al., 2022). Most of this divergence arises from measurement differences, especially in how the emissions data are reported. Being indirect, Scope 3 emissions are more prone to inconsistencies. Moreover, rating agencies apply different standards and criteria; therefore, substantial variability can be seen in overall ESG scores and their environmental components. A major cause of disagreement in ESG ratings is related to the treatment of emissions data. This article points out the growing need for clarity on how ESG factors, and especially emissions data, impact credit ratings and financial health. It also points out the inconsistent nature of ESG scoring methodologies, making direct comparisons so difficult. The paper contributes to the ongoing debate on the need for common standards in ESG reporting and offers practical implications for investors, regulators, and credit rating agencies who look forward to integrating sustainability factors into credit ratings.

The paper attempts to analyze the relationship between corporate credit ratings and ESG ratings, focusing much on

the role of Scope 1, 2, and 3 emissions. Based on the largest United States and European Union top 100 market capitalization companies, Furthermore, this study investigates how various ESG rating methodologies might lead to differences in creditworthiness. The U.S. and EU are ideal for comparison because of their leading roles in global sustainability and financial markets, mature regulatory frameworks, and significant market capitalization. Whereas the EU focuses on regulatory-driven reporting, such as the CSRD, the U.S. relies more on voluntary disclosures, thus offering contrasting approaches to ESG integration. This comparison, therefore, shows how different regulatory environments influence the alignment between ESG ratings and emissions performance and thus offers a valuable insight that may serve as a benchmark for other regions. Gaps in ESG and emissions reporting arise in emerging markets due to generally weak regulations and transparency issues, especially on Scope 3 emissions. By focusing on regions with reliable, comprehensive datasets, this study ensures robust findings while underscoring challenges that may be even greater in other parts of the world. Future research could extend this analysis to emerging economies for a more global perspective.

1.1 Review of literature

Companies appear to implement practices that would improve their ESG ratings; however, not all these activities necessarily lead to actual effective GHG emissions reductions. Haque and Ntim (2017) have suggested that a "good process-oriented environmental performance" strategy, such as planning for carbon reduction, is often adopted for symbolic reasons rather than substantively to improve actual carbon performance. This also agrees with findings by Raghunandan and Rajgopal (2022), showing that ESG funds are typically inclined to invest in companies disclosing carbon emissions while holding stocks with higher carbon emissions per unit of revenue, indicating the probable disconnection of high ESG scores from actual performance in carbon emissions. Liu et al. (2023) indicates that ESG scoring mainly quantifies the sustainability efforts of a company, rather than its actual environmental impact, such as carbon emissions. This is corroborated by Zhou (2023), who noted that although strong ESG performance might indeed have positive impacts on customers, it does not relate directly to lower emissions.

According to Treepongkaruna et al. (2024), firms with high ESG or environmental ratings are said not to represent those that emit a lower amount of carbon. Some of these firms, even with high ratings, are quite high emitters. The study by Sarwono (2022) further postulates that a link may exist between ESG indices and sustainability efforts, but this does not necessarily translate to long-term environmental performance. These could simply mean companies going about their operations in ways that improve their ESG ratings without necessarily making great strides in the reduction of actual carbon. This underlines a growing need for subtlety in ESG metrics and what they say about environmental performance.

Greenwashing refers to the dissemination of false information relating to the environmental practices of an organization (Ha et al., 2022). As suggested by Kommuri (2024), greenwashing is a strategic tool resorted to by organizations to present the image of a socially responsible corporation on environmental issues, although very few changes are brought into their activities. It is related to the legitimacy theory, as the strategy of greenwashing is followed for the acquisition of public legitimacy. According to legitimacy theory, organizations adopt certain practices that help them retain or gain legitimacy in the perception of their stakeholders. Legitimacy theory goes on to further support the view that companies whose environmental performance is under question would use greenwashing as a means of communicating the impression of sustainability without necessarily changing any core practice. Ha et al. (2022) points out that besides legitimacy theory, the theory of signaling forms a quite important approach to assessing how greenwashing helps firms create brand equity with the proper management of stakeholder perceptions. Both theories demonstrate simultaneously that business entities may, therefore, just work at the symbolic levels of action without necessarily altering their actual central practices that offer real environmental benefits.

More recently, there has been a growing interest and increasing trend in linking ESG ratings with credit ratings for which stakeholders attempt to seek correlations about how nonfinancial factors influence creditworthiness. The nature and strength might differ across contexts and methodologies. On the contrary, firms with poorer ESG ratings, particularly Scope emissions, have higher equity costs and a lower probability of receiving responsible investments. Avramov et al. (2020), indicate that there is a circular relationship between disclosure on ESG matters and credit ratings and that credit ratings are a major determinant of disclosure on ESG indicators. This, in turn, may create feedback loop between these two metrics: firms with higher credit ratings could feel called upon to improve ESG disclosures to keep such a favorable status (Bhattacharya and Sharma 2019). Similarly, Niedziółka (2023) underlines the fact that ESG risks, especially regarding social and governance dimensions, may meaningfully affect credit ratings and thus signal that firms with better ESG performance can enjoy lower credit risks and hence better credit ratings. Chodnicka-Jaworska (2022) showed that ESG measures could make a lot of difference regarding credit ratings, particularly in the energy sector, because high ESG performance can influence long-term issuer credit ratings. Kim and Li (2021) also found that corporate governance factors highly contribute to credit ratings, particularly for firms that are weaker in their governance status.

1.2 Hypotheses

H0: ESG ratings do not consistently reflect actual corporate emissions performance.
H1: The relationship between ESG ratings and corporate credit ratings is weak or non-significant.

2. MATERIALS AND METHODS

The study was based on the market capitalization of the top 100 companies in the United States and the European Union (Table 1). Credit ratings for the companies were taken from Moody's and S&P Global. Further, the ESG ratings of the companies in question came from Refinitiv and S&P Global. Finally, data on Scope 1, 2, and 3 was retrieved from the ESG reports of the concerned companies. Therefore, all firms that had less than one credit rating from the two rating agencies reviewed less than one ESG rating from the two ESG rating agencies reviewed, or less than two Scope 1, 2, and 3 issues, were excluded from the dataset. In the end, this procedure left a sample of 154 companies for the U.S. and 124 for the EU. The collected data were then analyzed using the methods of correlation and regression to test the relationships between credit ratings, ESG scores, and emissions. Comparisons using quartiles were also conducted to test variability in these factors across different levels of credit and ESG ratings.

Table 1 Research sample

		S&P Global Credit	Moody's	S&P Global	Refinitiv	Scope 1	Scope 2	Scope 3	Revenue (k$)
EU	Sample number	200	200	200	200	200	200	200	200
	Cleaned sample number	113	95	116	124	123	123	119	124
USA	Sample number	200	200	200	200	200	200	200	200
	Cleaned sample number	152	148	152	154	154	154	131	154

Source: author's own contribution, 2025

The objective of the rescaling of credit ratings, as conducted in the context of the study, is to facilitate a standardized comparison of ratings from disparate agencies, thereby enabling the implementation of statistical analysis. The rating scales utilized by both Moody's and S&P Global are markedly disparate. To address this issue, a numerical transformation was implemented (Table 2). The subjective credit ratings of each agency were transformed into a unified numerical scale, spanning a range from 0 to 100. Each of the numerous rating categories from disparate agencies was transformed into a uniform numerical format through the implementation of a linear transformation

Table 2 Credit ratings scale transformation

S&P Global		Moody's	
AAA	100	Aaa	100
AA+	94	Aa1	95
AA	89	Aa2	90
AA-	83	Aa3	85
A+	78	A1	80
A	72	A2	75
A-	67	A3	70
BBB+	61	Baa1	65
BBB	56	Baa2	60
BBB-	50	Baa3	55
BB+	44	Ba1	50
BB	39	Ba2	45
BB-	33	Ba3	40
B+	28	B1	35
B	22	B2	30
B-	17	B3	25
CCC	11	Caa1	20
CC	6	Caa2	15
C	0	Caa3	10
		Ca	5
		C	0

Source: author's own contribution, 2025

3. RESULTS AND DISCUSSION

The descriptive statistics reveals significant discrepancies in environmental and financial indicators for companies in the United States and the European Union (Lukács and Tóth, 2025). These inconsistencies present a challenge in evaluating the sustainability performance of these corporations. The considerable variation in Scope 1, 2, and 3 emissions, as evidenced by the elevated standard deviation, illustrates that companies adhere to markedly disparate environmental practices, which may be influenced by factors such as industry type, regulatory environment, or even company size. This variability complicates cross-company comparisons and underscores the inherent challenges associated with the effort toward standardizing emissions reporting. Moreover, significant discrepancies between the S&P Global and Refinitiv ESG ratings, particularly in the United States, indicate the inherent limitations of relying on disparate ESG rating methodologies for consistent evaluation of sustainability performance. The significant discrepancy between these rating systems raises concerns about the reliability of ESG ratings as a proxy for genuine environmental impact, thereby challenging their integration into credit rating models.

Also, the credit ratings recorded for the different states show a large extent of comparability; and the relationship between the credit ratings and ESG scores is a topic that requires further research. Given the minor variation in credit ratings among the analyzed states, it is plausible that the relationship between economic health and ESG performance is limited for those states for which emissions data is not reported or has not been aggregated on a comparable basis. This, therefore, gives more reason as to why there should be an examination of the probable disparity between the outcomes of sustainability and

financial results. This would indicate that one of the key conflicts in corporate sustainability may be realized through the fact that economic growth often coincides with high environmental degradation. This occurs because bigger companies are usually found to report higher revenues with higher associated emissions. These results reinforce the case for developing more harmonized frameworks for ESG reporting, complemented by full regulatory guidance. The result would be to ensure that sustainability metrics are representative of corporate environmental performance and meaningfully captured in credit analysis.

The quartile analysis highlights discrepancies in ESG and credit ratings regarding corporate emissions across different quartiles and rating agencies. Companies with higher ESG scores from S&P Global generally report lower direct (Scope 1) and indirect (Scope 3) emissions, while those rated highly by Refinitiv often disclose higher Scope 2 and 3 emissions, suggesting methodological differences in rating agencies' emphasis on transparency versus absolute emissions reduction (Lukács and Tóth, 2025). In the U.S., firms with higher S&P Global credit ratings tend to have higher direct emissions, whereas Moody's higher-rated companies exhibit better emissions management (Lukács and Tóth, 2025). In the EU, companies with stronger credit ratings also demonstrate lower Scope 1 and 2 emissions but report significantly higher Scope 3 emissions, likely due to broader disclosure requirements or larger operational footprints (Lukács and Tóth, 2025). These findings underscore inconsistencies in how ESG and credit ratings account for emissions, questioning their reliability as indicators of corporate sustainability.

Table 3 presents correlation data between credit ratings, ESG ratings, Scope 1, 2, and 3 emissions, and revenue for European Union companies. A key insight is the strong positive correlation between S&P Global Credit Ratings and Moody's Credit Ratings (0.918***), indicating a high degree of alignment between the two credit rating agencies. However, neither S&P Global nor Moody's credit ratings show significant correlations with Scope 1, 2, or 3 emissions, suggesting that credit ratings in the EU do not

strongly reflect a company's emissions performance. There is a positive correlation between Refinitiv ESG ratings and both Scope 1 emissions (0.239**) and Scope 2 emissions (0.257**), indicating that companies with higher Refinitiv ESG scores tend to report higher direct and indirect emissions. This could reflect either better transparency or larger operational scales among highly rated ESG companies. Additionally, revenue shows a positive correlation with credit ratings (0.237* with S&P Global and 0.302** with Moody's) and emissions, particularly Scope 1 emissions (0.444**), Scope 2 emissions (0.353***), and Scope 3 emissions (0.365***). This indicates that larger companies, while having better credit ratings, also tend to have higher emissions across all scopes, reflecting the environmental challenges faced by larger firms.

Table 4 reports correlation data for U.S. companies exploring the relationships between credit ratings, ESG ratings, Scope 1, 2, and 3 emissions, and revenue. As expected from the EU sample shown in Table 3, there is a strong positive correlation between S&P Global Credit Ratings and Moody's Credit Ratings (0.855***), indicating a high degree of consensus between these two rating agencies for the United States. However, both S&P Global and Moody's credit ratings show no significant correlation with Scope 1, 2, or 3 emissions, suggesting that credit ratings in the U.S., as in the EU, do not directly reflect companies' emissions performance. In contrast to the EU sample, Refinitiv ESG ratings in the U.S. show only a weak positive correlation with Scope 1 emissions (0.263**), Scope 2 emissions (0.268***), and Scope 3 emissions (0.211*). This indicates that, while there is a relationship between higher Refinitiv ESG scores and emissions, it is weaker than in the EU sample. Additionally, revenue is positively correlated with both credit ratings (0.255** with S&P Global and 0.322*** with Moody's) and all emission scopes, particularly with Scope 2 emissions (0.416***) and Scope 3 emissions (0.415***). This reflects a similar pattern to the EU, where larger companies tend to have better credit ratings but also higher emissions across all scopes.

Table 3 Correlation in the EU sample

	S&P Global Credit	Moody's	S&P Global	Refinitiv	Scope 1	Scope 2	Scope 3	Revenue (k$)
S&P Global Credit	-							
Moody's	0.918***	-						
S&P Global	-0.048	-0.034	-					
Refinitiv	0.196*	0.205*	0.388***	-				
Scope 1	-0.186	-0.094	0.181	0.239**	-			
Scope 2	-0.189*	-0.099	0.167	0.257**	0.754***	-		
Scope 3	-0.185	-0.077	0.048	0.170	0.693***	0.647***	-	
Revenue (k$)	0.237*	0.302**	0.164	0.440***	0.444***	0.353***	0.365***	-

Source: author's own contribution, 2025

Table 4 Correlation in the US sample

	S&P Global Credit	Moody's	S&P Global	Refinitiv	Scope 1	Scope 2	Scope 3	Revenue (k$)
S&P Global Credit	-							
Moody's	0.855***	-						
S&P Global	0.026	0.054	-					
Refinitiv	0.046	0.085	0.435***	-				
Scope 1	-0.114	-0.083	0.096	0.263***	-			
Scope 2	-0.142	-0.022	0.087	0.268***	0.738***	-		
Scope 3	-0.089	-0.075	0.059	0.211*	0.642***	0.561***	-	
Revenue (k$)	0.255**	0.322***	-0.068	0.222**	0.337***	0.416***	0.415***	-

Source: author's own contribution, 2025

Table 5 shows the regression results between S&P Global and Moody's credit ratings in the EU dataset. The regression analysis reveals a very strong relationship between the two credit rating agencies, with an R-value of 0.928 and an R^2 value of 0.860, indicating that 86% of the variability in S&P Global credit ratings can be explained by Moody's credit ratings. The F value of 524 and its high significance ($p < 0.001***$) reinforce the robustness of this relationship. This suggests that both agencies are highly consistent in their credit rating assessments for EU companies, which indicates that companies' creditworthiness is viewed similarly by both S&P Global and Moody's in this region. Table 5 presents similar regression results for the U.S. dataset, showing a strong relationship between S&P Global and Moody's credit ratings, though slightly weaker than in the EU. The R-value is 0.895 and the R^2 value is 0.802, meaning that 80.2% of the variation in S&P Global credit ratings can be explained by Moody's ratings. The F value of 583 and its high significance ($p < 0.001***$) confirm the strong association between the two agencies. Although slightly lower than in the EU, the close alignment in credit ratings between the two agencies in the U.S. also indicates a high level of consistency in how corporate creditworthiness is evaluated.

Table 5 Regression of S&P Global Credit and Moody's in the EU dataset

	EU	USA
R	0.928	0.895
R^2	0.860	0.802
Corrected R^2	0.859	0.800
Standard error	0.041	2.377
Observations	85	144
F value	524	583
F significance	0,001***	0,001***

Source: author's own contribution, 2025

Tables 6 and 7 show the results of regression analyses conducted on S&P Global and Refinitiv ESG ratings with Scope 1, 2, and 3 emissions among the EU datasets. Both tables indicate very limited statistically significant relationships between ESG ratings and emissions. From Table 7, the R^2 of the S&P Global ESG ratings is 0.005, which means that only 0.5% of the variability of ESG ratings is explained by Scope 1, 2, and 3. Besides that, the F statistic is low at 0.217 and the p-value is 0.885, thus not showing any statistical significance. In the same vein, results in Table 8 show that Refinitiv ESG ratings have weak explanatory power. It is evident in its R^2 of 0.026 and F of 1.05. Besides, it has a p-value of 0.374, indicating that the association is not statistically significant either.

Table 6 Regression of S&P Global ESG and Scope 1, 2, 3 in the EU dataset

	Values
R	0.077
R^2	0.005
Corrected R^2	-0.021
Observations	108
F value	0.217
F significance	0.885

	Estimate	Standard error	p-value
Intercept	57.9	1.59	<.001
Scope 1	7.28e-8	1.66e-7	0.663
Scope 2	2.97e-7	7.01e-7	0.673
Scope 3	3.28e-9	9.25e-9	0.724

Source: author's own contribution, 2025

The findings below show that (Table 7), in the EU sample, there is no significant relationship between ESG ratings by S&P Global and Refinitiv and the companies' reported Scope 1, 2, and 3 emissions. This may indicate that the ESG ratings, as assessed by these two agencies, are not accurately reflective of actual performance concerning emissions. This finding points to potential gaps between the ESG scores assigned to companies and their environmental impact in terms of GHG emissions. The fact that no strong correlation was found highlights the complexity associated with using ESG ratings as an indicator of environmental sustainability.

Table 7 Regression of Refintiv ESG and Scope 1, 2, 3 in the EU dataset

	Values
R	0.163
R^2	0.026
Corrected R^2	0.001
Observations	115
F value	1.05
F significance	0.374

	Estimate	Standard error	p-value
Intercept	73.3	1.31	<.001
Scope 1	-7.57e-8	1.34e-7	0.573
Scope 2	9.40e-7	5.97e-7	0.118
Scope 3	6.10e-9	7.91e-9	0.443

Source: author's own contribution, 2025

Tables 8 and 9 show the regression result of S&P Global and Refinitiv ESG rating against Scope 1, 2, and 3 emissions in the U.S. dataset.

Table 8 Regression of S&P Global ESG and Scope 1, 2, 3 in the US dataset

	Values
R	0.140
R^2	0.019
Corrected R^2	-0.003
Observations	125
F value	0.838
F significance	0.475

	Estimate	Standard error	p-value
Intercept	47.8	1.20	<.001
Scope 1	9.24e-8	9.73-8	0.344
Scope 2	6.56e-7	6.29e-7	0.299
Scope 3	-7.31e-9	9.38e-9	0.437

Source: author's own contribution, 2025

In Table 9, the R^2 value for S&P Global ESG ratings is 0.019, indicating that the variation in ESG ratings explained by the emissions is only 1.9%. With an F-statistic of 0.838 and a p-value of 0.475, this shows that the relationship observed is not statistically significant. In the same vein, Refinitiv ESG ratings reported somewhat weak results, as expressed by the R^2 value of 0.046 and the F-statistic of 2.05, as shown in Table 9. While this is a marginal increase from the results based on S&P Global, the p-value is 0.111, hence not significant.

The statistical test therefore reinforces the null hypothesis that ESG ratings do not consistently reflect actual corporate emissions performance (H0). Results, as depicted in Tables

6-9, suggest there is no significant correlation between ESG ratings and Scope 1, 2, and 3 emissions both in the U.S. and EU datasets. This would mean that ESG scores, as rated by various rating agencies, are not a good proxy for the environmental performance of a firm. Moreover, the study confirms that the relationship between ESG ratings and corporate credit ratings is weak or non-significant (H1). Regression results show that ESG ratings explain only a moderate portion of credit rating variations -R^2 values between 0.27 and 0.34-leaving a significant portion unexplained by ESG factors (Table 5). This would mean that financial and operational indicators are far more important in determining creditworthiness than ESG scores.

Table 9 Regression of Refinitiv ESG and Scope 1, 2, 3 in the US dataset

	Values
R	0.215
R^2	0.046
Corrected R^2	0.023
Observations	127
F value	2.05
F significance	0.111

	Estimate	Standard error	p-value
Intercept	70.4	1.05	<.001
Scope 1	-9.39e-8	8.56e-8	0.275
Scope 2	1.28e-6	5.52e-7	0.022
Scope 3	3.29e-9	8.24e-9	0.690

Source: author's own contribution, 2025

Furthermore, the quartile analysis in the dataset of Lukács and Tóth (2025) indicates inconsistencies between rating agencies: S&P Global's ESG ratings align with lower Scope 3 emissions, while Refinitiv's higher-rated companies report greater indirect emissions. This divergence points to methodological inconsistencies in ESG assessment, further undermining their reliability as sustainability indicators. The bottom line of the statistical evidence is that separate regulatory oversight of emissions data is required. ESG ratings cannot capture environmental performance adequately. Policymakers should focus on pursuing harmonized emissions reporting standards, rather than ESG scores, to make corporate sustainability transparent and accountable.

3.1 Discussion
The result of this study documents significant divergences in ESG ratings, credit ratings, and emissions reporting, including Scope 1, 2, and 3 emissions. Finally, there is overall a low level of correlation between ESG ratings and levels of emissions across the US and EU samples. Companies with higher credit ratings tend to have larger Scope 1 and 2 emissions, but ESG ratings do not consistently reflect this emissions performance. This finding again points to the ongoing concern about

divergence in ESG rating methodologies and their implications for the assessment of corporate sustainability. The findings therefore support the literature that has been previously conducted on discrepancies within ESG ratings. Indeed, other studies, such as Berg et al. (2022) and Liu (2022), also indicate that the broad diversity within the methodological ways in which ESG ratings are derived explains most of the deviation in these rating scores. This inconsistency, particularly within how the agencies measure and report on Scope 3 emissions, complicates the assessment of a company's environmental impact. For instance,

Treepongkaruna et al. (2024) discussed greenwashing, where companies show positive ESG ratings while they reduce their insignificant emissions. An observation that occurs in the present study also shows that not all firms with higher ESG scores reveal lower emissions, showing their environmental performance to be reflected poorly by ESG scores. More importantly, this study does not find a significant relationship between ESG ratings and corporate credit ratings that would otherwise have supported the increasing chorus of claims that strong ESG performance automatically translates to superior levels of creditworthiness.

Our literature review indicates that Bhattacharya and Sharma (2019) were able to document evidence of a potential feedback loop between credit and ESG ratings. However, this study finds that although both factors are somewhat related to one another, their relationship is rather weak. In this regard, Vortelinos (2024) noticed that ESG scores and credit ratings are only a partial coincidence, particularly for those industries that bear a high level of environmental risk exposure. These findings together demonstrate the growing necessity of standardizing ESG reporting framework precepts also held by Billio et al. (2020) and other scholars. This would reduce the divergence in ratings and provide more uniform measures with which performance on sustainability is assessed; it may therefore better capture the reflection of environmental impacts in credit ratings.

The study confirms the poor correlation between ESG ratings and emissions performance, indicating that investors must consider emissions information directly in addition to ESG scores. Rating agencies must develop methodologies for aggregating ESG factors in a meaningful manner, and regulators must establish uniform reporting frameworks, particularly for Scope 3 emissions, to facilitate comparability. Standardizing ESG rating methodologies enhances transparency, comparability, and reliability by reducing inconsistencies that hinder accurate assessments (Berg et al., 2022). A unified framework ensures consistent criteria, improving trust in evaluations (Christensen et al., 2022). However, maintaining uniqueness is vital, as industries and regions require tailored assessments. This can be achieved by standardizing core metrics and allowing flexibility in sector-specific indicators, according to Kotsantonis and Serafeim (2019), so that ratings remain both comparable and reflective of companies' unique sustainability contexts. The findings reveal that Scope emissions must have specific regulation, apart from ESG rating frameworks; in fact, they should be incorporated into environment-related legislation in a manner that will enhance coherence and accountability. It is serious for investors and rating agencies to understand that ESG scores don't necessarily represent emissions performance; therefore, direct regulatory intervention is a must in contrast to relying on rating agencies to assess environmental impact. Policymakers must make harmonized frameworks for reporting emissions a top priority, and companies must make their sustainability efforts comply with regulatory requirements and not merely seek to enhance ESG scores. That will promote transparency, counteract the danger of greenwashing, and make emissions information a compliance matter and not a matter of rating discretion.

4. CONCLUSION

This study explores the relationship between corporate credit ratings, ESG ratings, and Scope 1, 2, and 3 emissions for large U.S. and EU companies, offering new insights into the inconsistencies between sustainability metrics and creditworthiness. By integrating credit ratings from Moody's and S&P Global, ESG scores from Refinitiv and S&P Global, and emissions data, the research highlights critical methodological divergences and their implications. The study's results underscore the urgent need for a standardized ESG reporting framework to reduce inconsistencies and improve the reliability of ESG metrics. Without such standardization, ESG scores may fail to serve as credible indicators for sustainability or credit risk. For investors, credit rating agencies, and regulators, the findings emphasize the importance of aligning ESG reporting practices with financial assessments to ensure greater transparency and comparability. ESG ratings are not suitable for assessing corporate environmental sustainability. The study suggests that regulatory standards, not ESG ratings, are needed to monitor and assess Scope emissions. Such standardized frameworks could measure emissions with greater independence and reliability.

Future research will have to explore sector-specific ESG issues, particularly in high-emitting industries, and explore reporting discrepancies in Scope 3 emissions in an attempt to develop normalized measurement frameworks. Cross-sectional studies comparing the effectiveness of regulations, investors' behavior, and long-term credit impact of ESG rating can contribute towards a deeper analysis of accuracy and financial value of sustainability performance metrics. In addition, leveraging AI and machine learning for ESG harmonization can make rating more uniform and enable a deeper integration of sustainability factors in financial decision processes.

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