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ESG RATINGS AND THE INVESTOR DECISION-MAKING PROCESS: A COMPARATIVE ANALYSIS OF RATING AGENCIES' DATA AND ITS EFFECT ON FINANCIAL PERFORMANCE

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ABSTRACT

Purpose- The purpose of this study is to engage in scholarly research in order to examine the correlation between environmental, social, and governance performance (ESGP) and financial performance (FP) across various industries. The aim is to enhance the overall comprehension of how variations in ESG scores from two rating agencies can potentially impact the relationship between ESGP and FP.

Methodology- This study undertakes a comparative and descriptive analysis of panel data comprising 464 companies operating in environmentally sensitive sectors worldwide. The dataset covers the period from 2011 to 2020 and incorporates ESG ratings from Bloomberg and Refinitiv databases, as well as the financial performance metric return on assets (ROA) sourced exclusively from Refinitiv covering the times series of 2012 to 2021.

Findings- According to our research, there is evidence of a relationship between ESG scores and return on assets (ROA), with distinct correlations depending on the rating agencies employed. Specifically, Refinitiv ESG scores demonstrate a negative correlation with ROA, while Bloomberg ESG scores reveal a positive correlation. Additionally, our study highlights a positive correlation specifically between the Bloomberg environmental score and ROA.

Conclusion- Previous scholarly studies have already established a correlation between the level of information disclosure displayed by corporations and the aforementioned matter being investigated. However, our research suggests that the varying findings documented in existing academic papers may also stem from the utilization of ESG score data sourced from various rating agencies.

Keywords: ESG performance, financial performance, ROA, panel data analysis, rating agencies
JEL Codes: Q56, G24, C33

1. INTRODUCTION

In 2006, the United Nations (UN) instituted the Principles for Responsible Investment to encourage sustainable investment practices. In contrast to the United Nations Global Compact (UNGC), this endeavor aimed to incentivize investors to engage in ethical investments rather than exert coercive measures on corporate activities. The PRI has garnered over 5,000 endorsers, which collectively manage assets worth US$121tn, thereby establishing themselves as the leading advocates of responsible investment practices worldwide. As per the Principles for Responsible Investment (PRI), responsible investing is characterized as a methodology and custom that involves the incorporation of ESG (environmental, social, and governance) factors in investment decision-making and the practice of actively engaging with invested companies to influence their behavior.

Caldera et al. (2019) claim that numerous studies have indicated that corporations are implementing sustainable business strategies as a means of contributing to the circular economy. Marcus et al. (2010) and Demirbag et al. (2017) argue in favor of advocating for enhanced accountability in dealings with customers and suppliers, as well as prioritizing ecologically sustainable business operations. Furthermore, Collins et al. (2010) demonstrated a rise in the number of corporations that are embracing environmentally conscious measures.

As a consequence of this increased demand, various sustainability-related policies, regulations, and initiatives are being produced by both politicians and businesses. Several new financial concepts, including sustainable finance by Porter & Kramer (2011), sustainable investment by Clark et al. (2015) green investment, and green bonds by Sustainable Finance Progress Report (2019) have emerged to address sustainability-related challenges. Institutions participate in sustainability initiatives by valuing society from several perspectives and by attempting to build a brand based on a sustainable worldview.

The utilization of ESG data enables the evaluation of a company's sustainability performance, identification of potential risks and opportunities, and informed investment decision-making. The utilization of ESG data has emerged as a significant tool for companies to improve their ESGP. The increasing importance of ESG factors among investors, consumers, and employees can account for this phenomenon. Khan (2019) and Arvidsson & Dumay (2022) claim that over the course of the last decade, there has been a significant surge in the number

of companies that are measuring and reporting ESG data. Moreover, studies of Kim & Li (2021) and Friede et al. (2015) endorse the idea that ESG factors can confer competitive advantages and superior investment returns. Ram Nidumolu (2009) argues that sustainability is not just a social or environmental issue, but also a business imperative companies that ignore sustainability will be at a competitive disadvantage in the years to come.

ESG information is progressively being utilized by a range of entities, including organizations, stakeholders, and investors. Scholars have discussed the importance of ESG information for over three decades in the academic literature, and the vast majority of organizations that prioritize quality compliance have successfully incorporated ESG practices.

Numerous studies investigating the impact of ESG activities on the FP of organizations in various sectors reveal negative, positive, and insignificant results. In our research, we aimed to uncover the reasons behind these mixed findings and discovered that one possible explanation is the use of data from different rating agencies.

2. LITERATURE REVIEW

According to Eccles et al. (2014), the influence of corporate sustainability on organizational procedures and outcomes varies based on the choice of criteria employed to measure sustainability performance. Clark et al. (2015) suggests that differences in business practices across different markets and industries can also impact the relationship between ESGP and FP. In our research, we specifically examined and analyzed data collected from two specific rating agencies. According to the literature, one of the challenges of accurately measuring and evaluating ESG scores is the availability and quality of data. Kotsantonis & Serafeim (2019) claim that different sources of data can have different levels of granularity, accuracy, and completeness, which can affect the conclusions drawn from any analysis of the relationship between ESG factors and FP.

Additionally, the research of Eccles & Serafeim (2013) has demonstrated that corporations that place a high value on environmental sustainability are inclined to exhibit superior operational efficiency, reduced expenses, and an enhanced reputation, all of which may culminate in long-term financial gains. The authors of the study have deduced that companies that give priority to environmental sustainability can obtain substantial financial benefits. The authors of the study observed that there is a growing recognition of the correlation between sustainability and financial performance.

Moreover, an increasing body of evidence confirms the claim that there exists a positive correlation between ESGP and Financial Performance FP. The study by Friede et al. (2015) demonstrates organizations that exhibit high ESG ratings have been observed to experience reduced capital costs and improved operational efficiency, ultimately resulting in increased profitability and stock returns.

3. DATA AND METHODOLOGY

Our research cluster comprises six industrial groups according to the TRBC system: chemicals (95), coal (13), Construction Materials (24), Metals and Mining (176), Oil and Gas (154), and uranium (2). We selected 464 companies worldwide, with 254 located in Europe and North America, 102 in Eastern and South-Eastern Asia, 54 in Oceania, 20 in Latin America and the Caribbean, 16 in Sub-Saharan Africa, 11 in Central and Southern Asia, and seven in Northern Africa and Western Asia.

To compare the results of panel data analyses of the same sampled companies, ESG scores were obtained from the Refinitiv Data Platform and Bloomberg Terminal for the years 2011-2020, and the data were collected in May 2022.

To address the endogeneity problem, we used FP data from 2012 to 2021 and ESG data with a one-year lag following the approach used in previous studies by Choi & Wang (2009), Manrique & Martí-Ballester (2017), and Velte (2017). In line with the existing literature, our analysis of FP includes an accounting-based measure ROA. By using this widely accepted measure used in research of Peiró-Signes et al. (2013), Galbreath (2013) and Velte (2017), our study aims to provide a more comprehensive understanding of how differences in ESG scores from the two rating agencies may affect the relationship between ESGP and FP.

3.1. Research Method

To ensure a strongly balanced dataset for panel data analysis, we reduced our research sample to 464 companies. This deliberate reduction allowed us to achieve a more balanced representation across various factors or variables under investigation. We conduct our research with software named STATA version 14.2. The primary objective of our research is to perform a statistical comparison over ten years, focusing on the ESG data obtained from Bloomberg and Refinitiv, as well as the corresponding FP data sourced from Refinitiv. By utilizing a strongly balanced dataset, we aim to enhance the reliability and robustness of our findings, enabling us to draw meaningful results.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	4640	0.027	0.112	-1.161	1.077
ESGB	4640	44.729	14.114	6.861	82.014
ESGR	4640	49.418	21.307	1.338	91.495
ENVB	4640	29.783	22.874	0.000	89.097
ENVR	4640	47.126	26.981	0.000	96.339
SOCB	4640	27.341	15.638	0.000	76.965
SOCR	4640	47.504	24.845	0.149	97.153
GOVB	4640	76.953	13.539	9.753	100
GOVR	4640	55.857	22.37	0.728	99.509

Size	4640	9.743	0.72	6.883	11.614
Usr	4640	0.241	0.155	0.0000	1.092
Lvg	4640	0.812	3.664	0.0000	225

*Descriptive statistics of the different dependent, independent, and control variables for our entire sample of 4640 observations. The definitions of the variables can be found in the Data Set chapter below. "Obs" represents the number of observations. "St. Dev" represents the standard deviation.

Table 2: Pairwise Correlations

Variables	**ROA**	**ESGB**	**ESGR**	**ENVB**	**ENVR**	**SOCB**	**SOCR**	**GOVB**	**GOVR**	**Size**	**Usr**	**Lvg**
ROA	1.000											
ESGB	0.135*	1.000										
ESGR	0.121*	0.761*	1.000									
ENVB	0.156*	0.895*	0.730*	1.000								
ENVR	0.127*	0.684*	0.916*	0.716*	1.000							
SOCB	0.129*	0.898*	0.719*	0.764*	0.637*	1.000						
SOCR	0.120*	0.721*	0.924*	0.681*	0.792*	0.711*	1.000					
GOVB	0.01	0.579*	0.317*	0.230*	0.196*	0.364*	0.284*	1.000				
GOVR	0.036*	0.464*	0.614*	0.359*	0.370*	0.405*	0.410*	0.378*	1.000			
Size	0.193*	0.441*	0.558*	0.459*	0.568*	0.408*	0.487*	0.136*	0.292*	1.000		
Usr	-0.138*	0.100*	0.123*	0.111*	0.136*	0.079*	0.081*	0.034*	0.079*	0.316*	1.000	
Lvg	-0.082*	0.006	0.008	0.015	0.012	0.009	0.0001	-0.016	0.009	0.028	0.248*	1.000

*The symbol * indicate 10% significance level, respectively.

According to statistics in Table-2; the positive correlation observed between Return on Assets (ROA) and firm size is a predictable outcome, given that larger firms tend to possess greater assets and generate higher revenue, thereby resulting in increased profitability. The observation of a weak correlation between leverage and ESG score is noteworthy, as it implies that companies with higher levels of debt may exhibit a relatively lower degree of emphasis on environmental, social, and governance (ESG) issues There are various probable reasons for this trend, including the need to prioritize immediate financial gains or the challenges associated with effectively addressing ESG risks amidst high levels of debt. The observed positive correlation between size and ESG score is noteworthy, as it implies that firms with greater scale may possess a higher capacity to allocate resources towards ESG activities. There are various other possible reasons for these results, including the imperative to attract and retain both clientele and employees, as well as the aspiration to mitigate hazards and enhance sustained profitability.

3.2. Linear Regressions

Before conducting regression analysis, we tested the dataset for multicollinearity using the Variance Inflation Factor (VIF). VIF measures the increase in variance caused by multicollinearity in the dataset. A VIF value of 1 indicates no multicollinearity, while a value greater than 1 indicates its presence. A VIF value of 5 is considered substantial and suggests a significant multicollinearity problem.

Table 3: Variance inflation factors (VIF) Test

Variable	**VIF**	**1/VIF**	**Variable**	**VIF**	**1/VIF**
ENVR	3.51	0.284659	ESGR	2.78	0.359381
SOCR	3.4	0.293947	ESGB	2.38	0.420987
SOCB	3.09	0.323674	Size	1.6	0.625098
ENVB	3.08	0.324436	Usr	1.19	0.839544
GOVR	1.36	0.736057	Lvg	1.07	0.935844
GOVB	1.27	0.788408			
Size	1.65	0.605716	Mean VIF	1.8	
Usr	1.2	0.836382			
Lvg	1.07	0.935184			
Mean VIF	2.18				

The study tested three regression models using panel data regression analysis: pooled Ordinary Least Squares (OLS), random effects model, and fixed effects model. The Lagrange multiplier (LM) test was used to determine the suitability of either the random effects or pooled OLS model for a specific dataset. We conducted the Breusch-Pagan Lagrange multiplier (LM) test, which yielded a statistically significant result, leading to the rejection of the use of the pooled OLS approach. Subsequently, Hausman's test yielded a significant outcome, indicating the fixed effects model is appropriate for the analysis, distinguishing it from a random effects model. Based on our study's findings, it was observed that there is a need for including time-fixed effects in the model. The further examination involved conducting the heteroskedasticity test for the selected fixed effects model. The significant outcome of this test indicated the presence of heteroskedasticity in our fixed effects model. The robust option was employed to address this issue and correct the regression model.

Although our research time series is relatively short, we conducted the test for cross-sectional dependence to ensure the validity of our results. To address this concern, we have employed the B-P/LM test of independence. This test is commonly used to examine the presence of cross-sectional dependence in panel data and conclude that panels are correlated (cross-sectional dependence). We also applied the Pesaran CD test and concluded that there is a presence of cross-sectional dependence.

Finally, the test for the presence of serial correlation was conducted. And we found out that our regression model is affected by serial correlation.

Based on the tests conducted, it has been determined that running an "Entity and time fixed effects regression" would be appropriate for our research.

Data Set

$Yidt = \alpha id + \beta Xidt + \upsilon id + eidt,$

where id = company and t = year from 2011 to 2020; and:

αid (id=1 . . . 464) is the individual effect, which is a fixed effect that captures all the time-invariant unobservable heterogeneity that is specific to individual id.

Yidt is the dependent variable ROA;

ROA is the Return on Asset of firm id during period t data from Refinitiv

Xidt represents the independent and control variables;

Table 4: Independent and control variables

Independent Variables
ESGB is the ESG score of the company id during period t-1 data from Bloomberg
ESGR is the ESG score of the company id during period t-1 data from Refinitiv
ENVB is the Environmental score of the company id during period t-1 data from Bloomberg
ENVR is the Environmental score of the company id during period t-1 data from Refinitiv
SOCB Social score of company id during period t-1 data from Bloomberg
SOCR Social score of company id during period t-1 data from Refinitiv
GOVB Governance score of company id during period t-1 data from Bloomberg
GOVR Governance score of company id during period t-1 data from Refinitiv
Control Variables
Size is the log of total assets of company id during period t; data from Refinitiv
Usr is total debt/total asset of company id during period t; data from Refinitiv (unsystematic risk)
Lvg is the total debt/total equity of company id during period t; data from Refinitiv (leverage)

β is the coefficient on the independent variable, Xidt; uid is the individual error term, which captures all the unobservable heterogeneity that is specific to the individual id and is not captured by the entity effect or the time effect. εidt captures all the unobservable heterogeneity that is common to all entities and is not captured by the time effect

Model 1

H01: There is no significant correlation between ESG total scores and FP

HA1: There is a significant correlation between ESG total scores and FP

Model 2

H02: There is no significant correlation between ESG pillars and FP

HA2: There is a significant correlation between ESG pillars and FP

*(Letter B stands for Bloomberg Data Base and letter R for Thomas Reuters Asset-4 Refinitiv; t-1 stands for one year lag)

4. FINDINGS

The table-5 presents an overview of the current findings. Hypotheses H01 and H02 are partially rejected based on the observed outcomes. The results indicate a correlation between the ESG total scores and Financial Performance (FP). Additionally, a significant correlation is identified between the individual ESG pillar and FP. The overall analysis reveals a significant positive relationship between Return on Assets (ROA) and ESGB (ESG score of company id during period t-1 data from Bloomberg), whereas a significant negative correlation is observed between ROA and ESGR (ESG score of company id during period t-1 data from Refinitiv). However, within the cluster of six independent

variables, solely the ENVB pillar score (Environmental score of company id during period t-1 data from Bloomberg) manifests a positive correlation with ROA, while the remaining pillar scores exhibit no statistical significance. The control variables exhibit substantial correlations with the dependent variable as expected. Furthermore, it is worth highlighting that the leverage variable demonstrates a significant negative impact on ROA, indicating that firms burdened with higher levels of debt do not achieve superior profitability.

Table 5: Entity and Time Fixed Effects Regression

VARIABLES	Model 1	Model 2
ENVB		0.000487*** (-0.000159)
ENVR		-0.000194 (-0.000158)
SOCB		0.000229 (-0.000262)
SOCR		-0.000116 (-0.000163)
GOVB		-0.000285 (-0.000205)
GOVR		-0.000157 (-0.00011)
Size	0.0392*** (-0.00658)	0.0380*** (-0.00675)
Usr	-0.141*** (-0.021)	-0.140*** (-0.0209)
Lvg	-0.00112*** (-0.000328)	-0.00117*** (-0.000335)
ESGB	0.000656** (-0.000281)	
ESGR	-0.000361** (-0.000184)	
Constant	-0.331*** (-0.0615)	-0.283*** (-0.0673)
Observations	4,64	4,64
R-squared	0.129	0.134

*The robust and clustered standard errors are displayed in parentheses. The p-values are two-tailed. The symbols ***, **, and * indicate 1%, 5%, and 10% significance, respectively.

5. CONCLUSION

In the initial stages of our research, our primary objective was to identify and analyze the reasons of the contradictory results related to the relationship between ESG factors and the financial performance of companies in environmentally sensitive sectors. The increasing demand for sustainable investing, regulatory initiatives, corporate responsibility, societal impact, and lack of standardization have contributed to the growth of ESG rating agencies as a new sector in recent years. Carroll et al. (2017) demonstrates that the function of ESG rating agencies is vital in driving forward and establishing ESG principles by supplying information and evaluations of corporate social responsibility practices. The absence of uniformity in ESG reporting has played a role in the proliferation of ESG rating agencies, as investors and other interested parties have resorted to these agencies to facilitate their comprehension of the data and evaluate the performance of companies. Escrig-Olmedo et al. (2019) found that the methods currently being used by ESG agencies and sustainability indices are diverse and lack standardization. Kotsantonis & Serafeim (2019) suggests that investors are advised to drive for enhanced and significant ESG disclosure by refining their demand for ESG data to somewhat standardized, but still manageable metrics. La Torre et al. (2020) posits that ESG rating agencies help minimize information asymmetry, but the accuracy of ESG ratings can be compromised by different assessment standards, resulting in potential misjudgments. Yu et al. (2018) claims that there exists a positive correlation between ESG transparency and firm valuation metrics. The research further suggests that the mechanism by which firm value is influenced by ESG transparency is through the reduction of information asymmetry and agency costs.

The findings from our research are interesting and suggest that there is a difference in the way that Refinitiv and Bloomberg ESG scores are calculated and/or interpreted. The negative correlation between Refinitiv ESG scores and ROA could be due to several factors, such as the fact that Refinitiv ESG scores are based on a wider range of factors than Bloomberg ESG scores. The positive correlation between Bloomberg ESG scores and ROA could be because Bloomberg ESG scores are more focused on environmental factors, which are increasingly seen as being important to investors.

Finally, we have concluded that if any entity requires ESG data to evaluate the companies' CSR performance from different rating agencies, they will probably draw varying correlations due to their metric disparities. Therefore, it is important for investors and regulators to be aware of the limitations of ESG ratings. ESG ratings should not be used as the sole basis for investment decisions. Rather, they should be considered in conjunction with other factors, such as financial performance and management quality. The existence of different correlations reflects the subjective nature of ESG ratings, and the different perspectives and weighting systems employed by various agencies. This diversity of perspectives can provide investors and regulators with a broader understanding of a company's ESG performance but can also introduce challenges when comparing and benchmarking companies across agencies.

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